is given in Table 1 under the following headings: steel; chemical composition, %. The experimental work consisted of the following: a) tensile tests conducted on special cylindrical test pieces which had a short central portion of a diameter larger (10 mm) than that of the remainder (7 mm), the central portion being provided with a notch varying in depth from specimen to specimen, but having a constant shape and width; b) tensile tests on cylindrical specimens 10 mm in diameter, provided with notches of 5 different types but of the same depth - these specimens are illustrated in Fig. 1; c) static bending tests conducted on standard notched bar test pieces (55 x 10 x 10 mm); d) determination of the ductile-to-brittle transition temperature by impact tests at various temperatures. All the experimental specimens were oil-quenched and tempered at temperatures selected so as to ensure the UTS of approximately 100 kg/mm^2. By water-quenching or furnace-cooling the specimens from the tempering temperature, material in ductile or brittle condition was obtained. The difference between the steels studied can be illustrated by data given in

On brittle fracture of alloy steel

Table 3, where the effect of variation of the notch shape on various mechanical properties is shown under the following headings: type of steel; number of the specimen in Fig. 1; $\sigma_{B.H.}/\sigma_B$; $\sigma_{Z.H.}/\sigma_Z$; δ_H/δ ; ψ_H/ψ . $\sigma_{B.H}$, $\sigma_{Z.H.}$, δ_H and ψ_H denote, respectively, the UTS, true tensile strength, elongation, and reduction of area of the notched test pieces, σ_B, σ_Z , δ and ψ denoting the same properties of the unnotched specimen (specimen No. 1 in Fig. 1); each property of a notched specimen is therefore expressed in this table in % of this property of the unnotched test piece. The results of impact tests are reproduced in Fig. 3, where the impact strength (a_k, kgm/cm^2) is plotted against the test temperature ($^\circ$C), the four diagrams (from top to bottom) relating to steels 30ХГВТ (30KhGVT), 30ХГВМ (30KhGVM), 30Х2ГМТ (30Kh2GMT) 35ХНМ (35KhNM) and 40ХН (40KhN); the continuous curves relate to material in ductile condition, the brittle and semi-ductile condition being indicated by broken and dotted curves

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respectively. It was concluded that the Cr-Mn steel, containing approximately 0,3% C and additions of other carbide-forming elements, differs little from the Cr-Ni-Mo steels in respect to their tendency to brittle fracture under conditions of stress concentration. Steel 30Kh2GMT is least notch-sensitive, steels 30KhGVT, 30KhGVM and 35KhNM are approximately equal in this respect, steel 40KhN being most sensitive to the action of stress concentration. The effect of the degree of notch sharpness on strength and plasticity of the Cr-Mn steel was found to be similar to that observed in steel 35KhNM; the effect of stress-risers was particularly pronounced in steel 40KhN. It was found also that the notch-sensitivity and tendency to temper-brittleness can be assessed by static bending tests conducted on notched bar test pieces; assessed in this manner, steel 30KhGVM proved to have relatively high tendency to brittle fracture. The results of the impact tests showed that in respect to the tendency to temper brittleness and the ductile-to-brittle transition temperature steels 30KhGVT, 30KhGVM and 30Kh2GNT are similar to steel 35 KhNM steel 40KhN being characterised by a relatively higher tendency to

On brittle fracture of [illegible]y steel

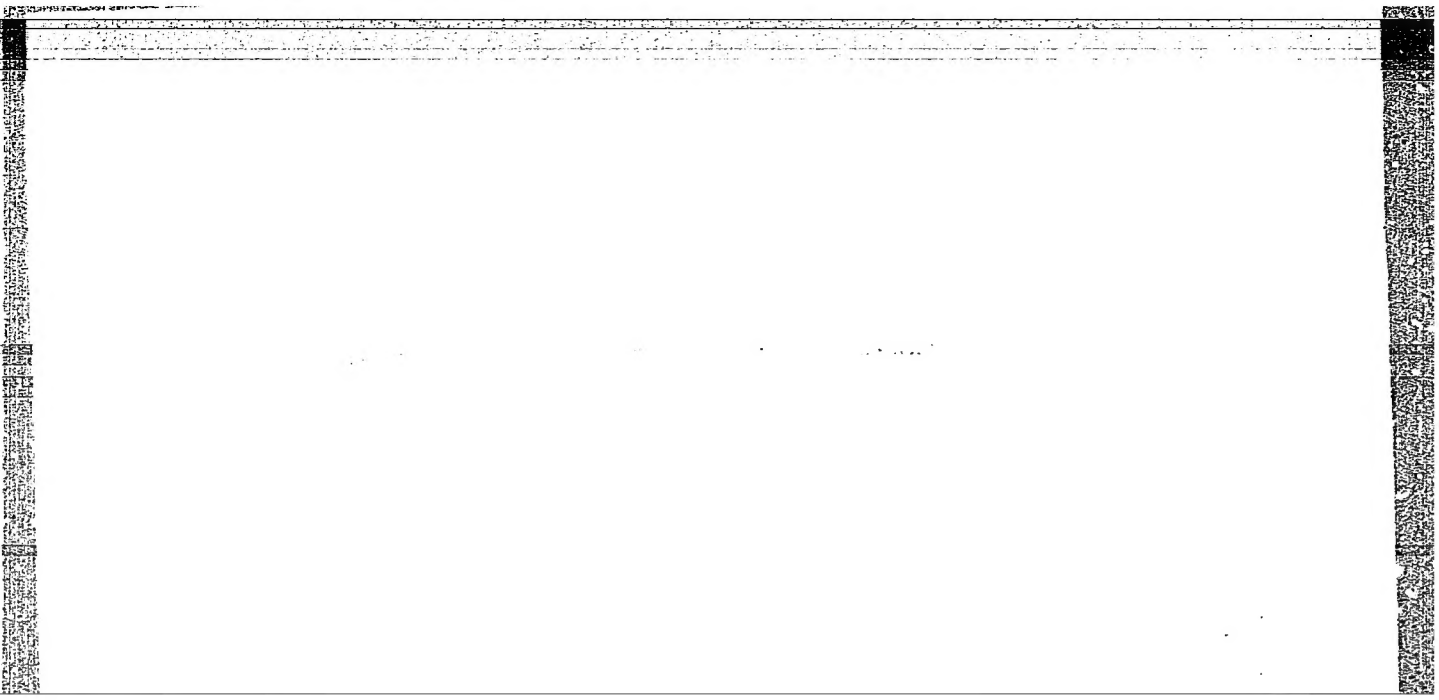
temper brittleness and a higher ductile-to-brittle transition temperature. It was inferred from the results of the present investigation that steels 30KhGV? and 30Kh2GMT can be recommended as substitutes for the Cr-Ni and Cr-Ni-Mo steels in the fabrication of machine components of complex shape, whereby considerable economies in the consumption of nickel and cobalt, which are not easily available, can be attained.
There are 3 figures and 5 tables.

SUBMITTED: October 1?, 1960

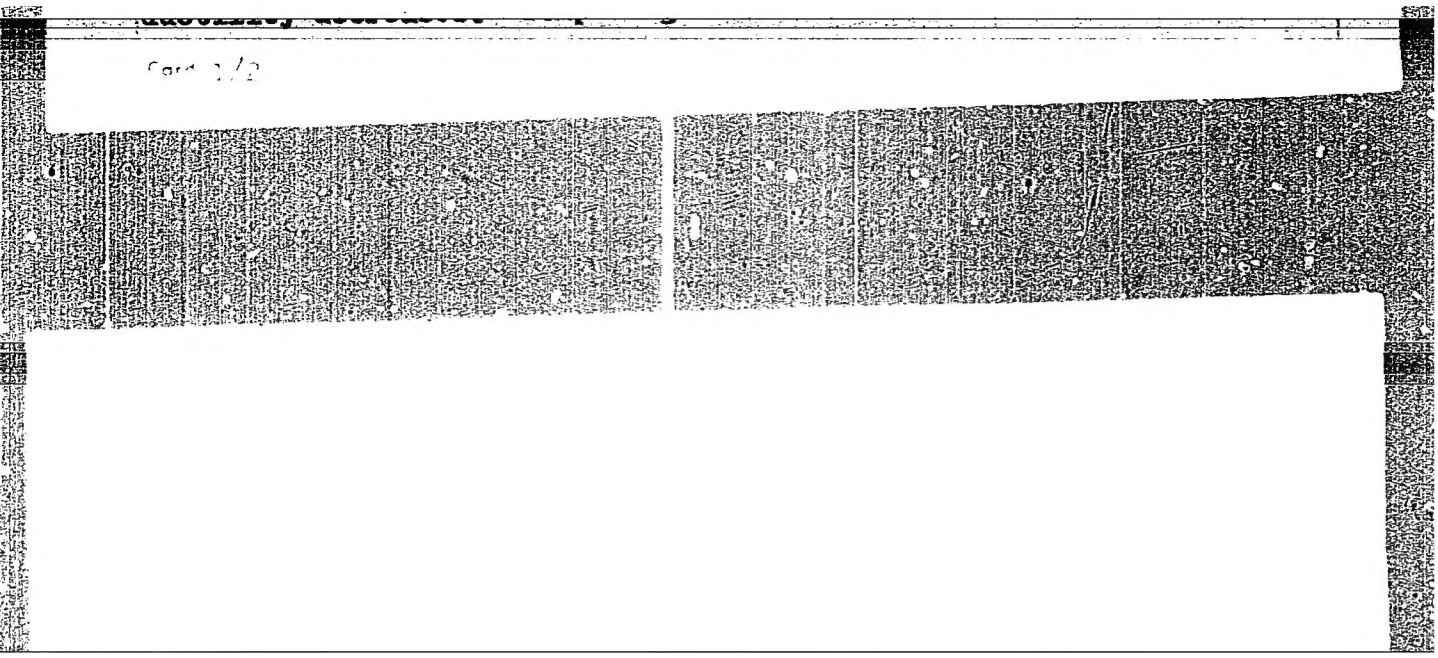
Card 5/9

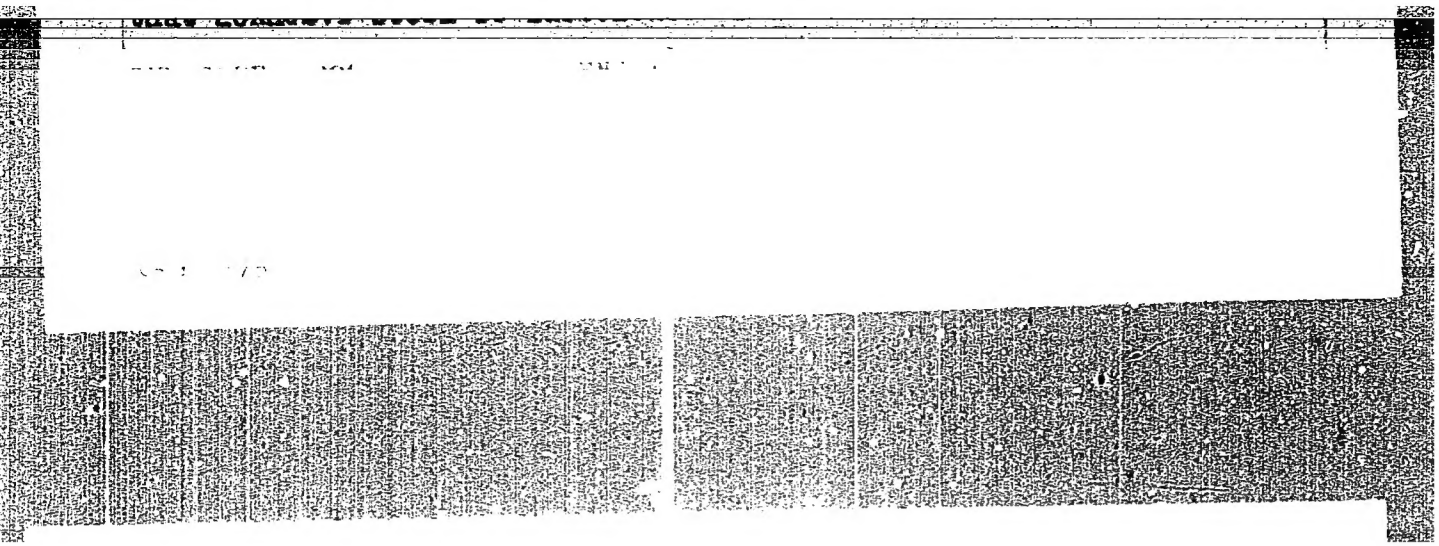
BRAUN, M.P., doktor tekhn. nauk; KONDRASHEV, A.I., inzh.; VINOKUR, B.B., kand. tekhn. nauk

Using multiple-alloyed steels for large articles hardened by high-frequency currents. Mashinostroenie no.5:49-50 S-O '64 (MIRA 18:2)



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860010014-0"





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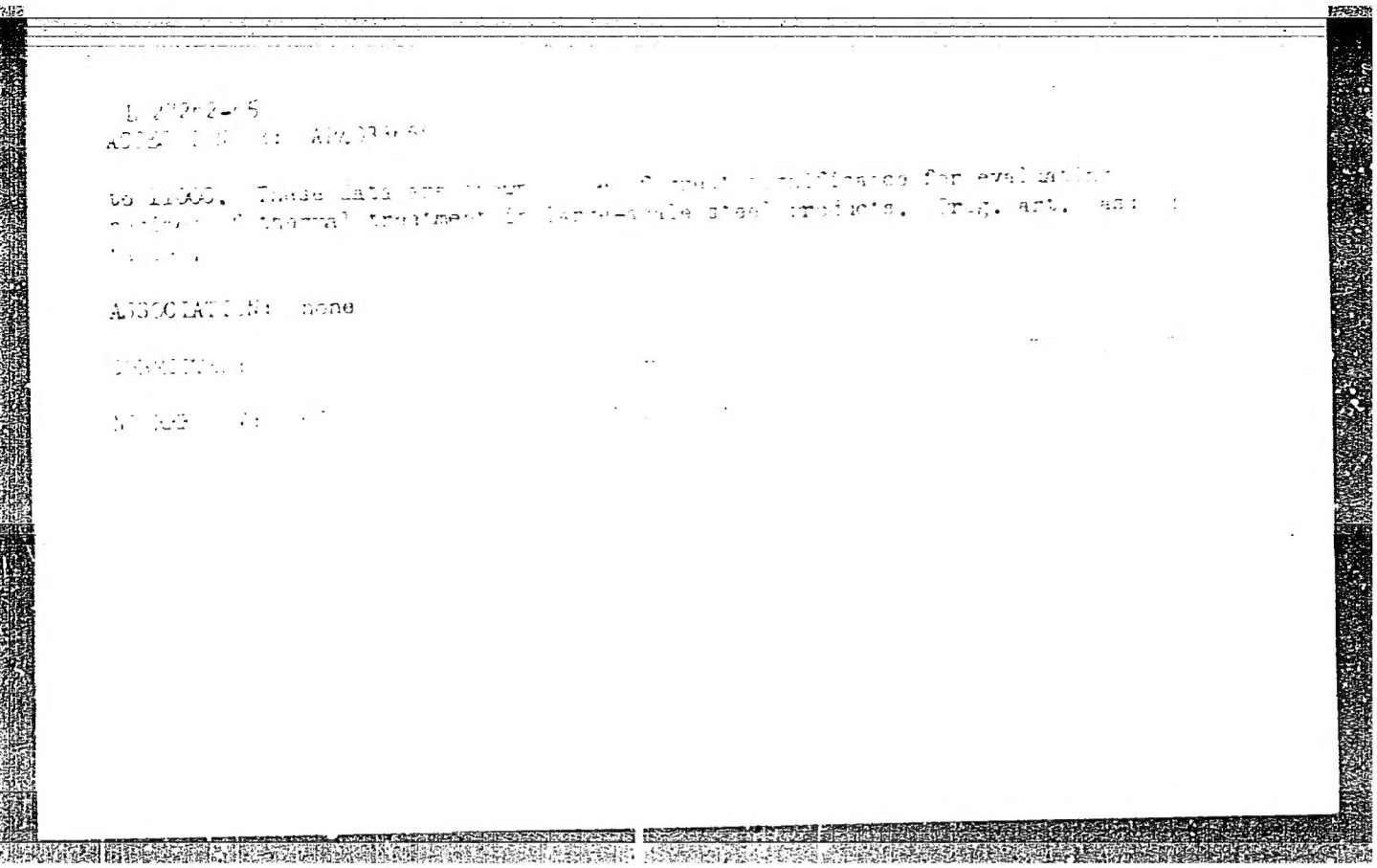
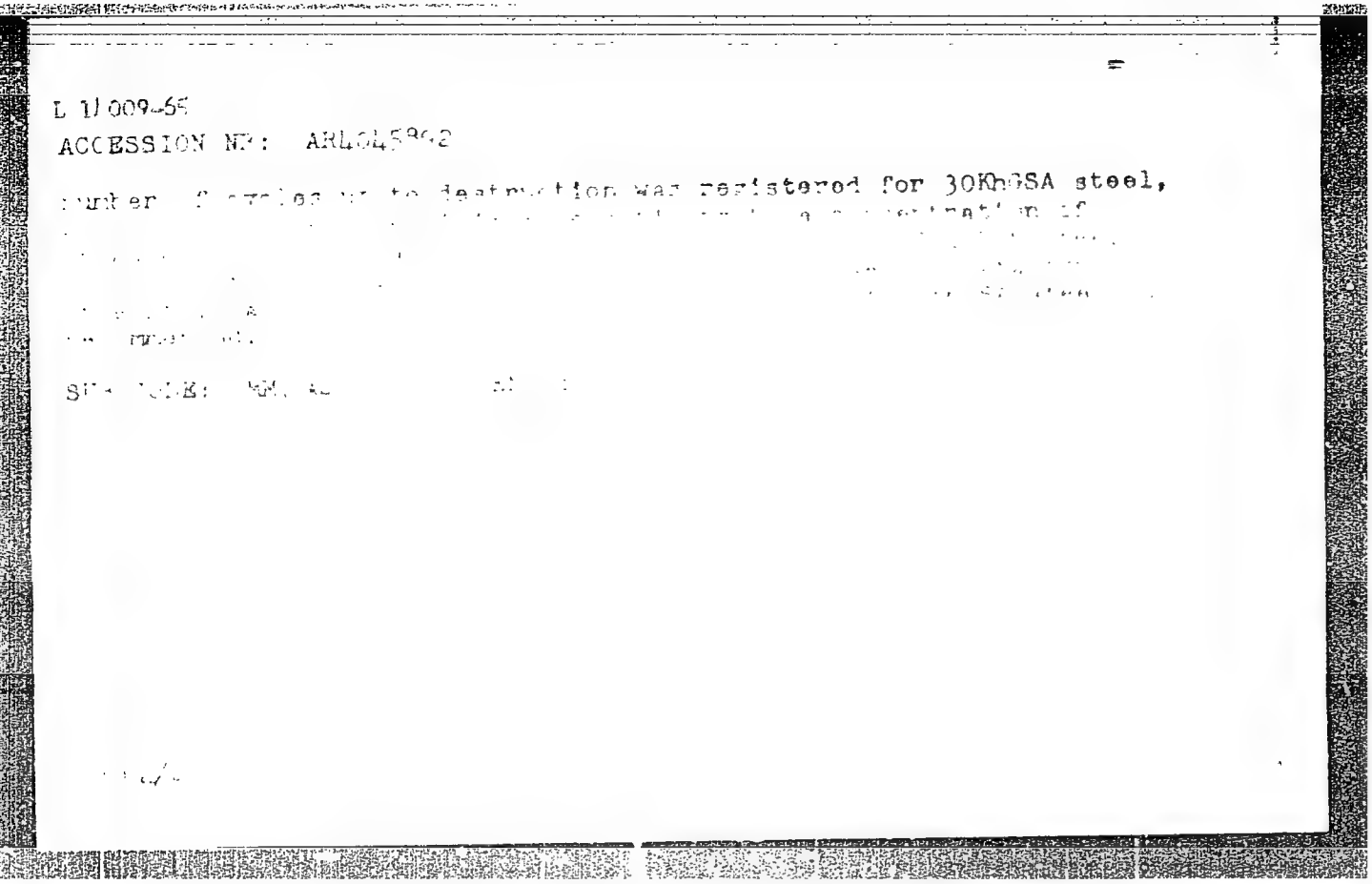


ASSOCIATION: none

TITLE: Non-nickel alloy steels for heavily loaded parts

1963, 41-46

TOPIC TAGS: alloy steel, load, steel bolt, connecting rod bolt, bolt



L 1/009-65
ACCESSION NR: AR4045942

number [illegible] to destruction was registered for 30KhGSA steel, [illegible]

[illegible]

[illegible]

[illegible]

BRAUN, M.P.; VINOKUR, B.B.; KONDRASHEV, A.I.; GELLER, A.L.

Chromium-manganese base steel for large forgings. Izv. vys. ucheb. zav.; chern. met. 4 no.8:108-111 '61. (MIRA 14:9)

1. Ukrainskaya akademiya sel'skokhozyaystvennykh nauk.
(Chromium-manganese steel)

VINOKUR, B.B.

PHASE I BOOK EXPLOITATION SOV/4384

Braun, Mikhail Petrovich, Bertol'd Bentsionovich Vinokur, Arkadiy Ivanovich Kondrashev, and Yekaterina Yevdokimovna Maystrenko

Mekhanicheskiye svoystva, teploustoychivost' i termicheskaya obrabotka legirovannoy stali (Mechanical Properties, Heat Resistance, and Heat Treatment of Alloy Steel) Kiyev, AN Ukrainskoy SSR, 1959. 190 p. 3,000 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut liteynogo proizvodstva.

Resp. Ed.: A.A. Gorshkov, Corresponding Member, Academy of Sciences Ukrainskaya SSR; Ed.: T.K. Remennik; Tech. Ed.: R.A. Buniy.

PURPOSE: The book is intended for technical personnel in machine-building enterprises. It will also be of interest to members of scientific research organizations.

COVERAGE: The book presents and analyzes the results of studies of the mechanical properties of steels alloyed with various elements. Two groups of alloyed steels (with Mn, Cr, Ni, Si - as basic constituents, and with Ti, or V, or W, or Mo, or Ni, or their combinations added) are investigated. The compositions of steels in both groups are alike. The only essential difference between steels

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of the first and second group is that the steels of the former (total-9) have arcund 1.5%Ni, whereas the steels of the latter (total-12) have around 2.5% Ni. Data on the tendency of steels to brittle fracture and fatigue and on the structural transformations of steels during their regular and isothermal heat treatment are presented. Particular attention is given to the experimental study of the characteristics of heat resistance (creep, endurance, and relaxation of stresses). Engineers N.I. Kon, K.F. Gruzhiyenko, V.P. Manuylova, P.N. Pershikov, N.N. Ruban, and O.S. Kostyrko participated in carrying out experimental works. There are 154 references: 145 Soviet and 9 English.

TABLE OF CONTENTS:

Vinokur, B.B.

S/148/[illegible]

AUTHORS: Braun, M.P., Kostyrko, O.S., Litenko, N.P., [illegible] Vinokur, B.B., Mirovskiy, E.I.

TITLE: Ductility of Steel in the Range of High Temperatures [illegible]

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1960, Nr 2, pp 57 - 61

TEXT: The authors investigated the effect of elevated temperatures of steel on its ductility and workability by pressure. [illegible] Chromium 55Kh and chrome-nickel-titanium [illegible] steels were [illegible]. Their composition is given in a table. The specimens were [illegible] impact tests, static tension and dynamic jolting. Prior to [illegible] 45 steel specimens were preheated from 1140° to 1270°C, [illegible] 1220° to 1250°C and 5KhNT from 1180° to 1210°C. Results [illegible] in graphs (Figures 1, 2, 3). They show that a raise of [illegible] does not reduce ductility and workability by pressure of the steels. [illegible] the range of high temperatures (1100° - 1200°C) ductility of [illegible] steel exceeds that of 55 Kh and 45 grade steel due to speeded-up development of

VB

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recrystallization processes. It appears from graphs 1, 2, 3 and a set of photographs (4) that higher content of C, Cr, Ni and particularly Ti [illegible] up the recrystallization processes. Addition of Cr, Ni, Ti and C atoms reduces the interatomic attraction in austenite crystals; this appears in the lower melting temperature of 5KhNT steel in comparison to 55Kh and 45 grade steel.
There are: 1 table, 3 sets of graphs, 1 set of photographs and 4 Soviet references.

ASSOCIATION: Ukrainskaya akademiya sel'skokhozyaystvennykh nauk (Ukrainian Academy of Agricultural Sciences)

SUBMITTED: February 12, 1959

VB

Card 2/2

VINOKUR, B.B.

BRAUN, M.P.; VINOKUR, B.B.; IVANOV, F.I.; SLASTNIKOVA, L.F.

Austenite transformation during continuous cooling of certain steels used in making large cross-section machine parts. Sbor. nauch. rab. Inst. metallofiz. AN USSR no.7:137-148 '56. (MIRA 11:1)
(Steel alloys--Metallography)

BRAUN, M.P., doktor tekhn.nauk, prof.; VINOKUR, B.B., inzh.; KONDRASHEV, A.I., inzh.; MAYSTRENKO, B.Ye., inzh.

Properties of steels for large cross-section parts. Izv.vys. ucheb.zav.; chern.met. 2 no.6:67-73 Je '59. (MIRA 13:1)

1. Ukrainskaya akademiya sel'skokhozyaystvennykh nauk i Novo-Kramatorskiy mashinostroitel'nyy zavod. Rekomendovano kafedroy tekhnologii metallov i metallovedeniya Ukrainskoy Akademii sel'skokhozyaystvennykh nauk.
(Steel alloys--Testing)

85130

S/182/60/000/004/001/007
A161/A029

1.1400

AUTHORS: Braun, M.P., Vinokur, B.B., Mirovskiy, E.I., Geller, A.L., Mar'yushkin, L.G.

TITEL: The Effect of Hot Forging Conditions on the Properties of Large Forgings

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 4, pp. 8-11

TEXT: To analize the effect of heating temperature on the properties of large forgings, a statistical analysis of two years shop records and data of previous investigations (Refs. 1-12) were used and experiments with 30 to 40-ton steel ingots were carried out. Ingots of 55X (55Kh), 55XH (55KhN) and 35XHM (55KhNM) steel were heated to higher temperature than usual and forged into stepped pieces with diameters of 960, 670 and 480 mm. Due to the higher temperature forging could be completed with a single heating, whereas in the established shop practice metal has to be heated twice with intermediate reheat. The effect of overheat and holding time at forging temperature was studied. It was stated that the compulsory longer heating time did not spoil the metal properties even when metal was heated to 30 to 40°C above the established limit. Macrostructure

Card 1/3

The Effect of Hot Forging Conditions on the Properties of Large Forgings

analysis revealed the same destruction of dendrites as is observed in forging with the accepted lower forging temperature; microstructure analysis with etching by a heated saturated aqueous solution of picric acid revealed no austenite grain growth. Test results proved that the tensile strength was slightly higher after a 30-hour holding at forging temperature than after a 10-hour holding; the cold brittleness threshold (i.e., the temperature at which impact resistance drops to 50 %) was at -100°C after a 30-hour holding and at -60°C after 10 hours (diagram, Figure 1) in 35KhNM steel; about -20°C in 50KhN (Fig. 2), and -25°C in 55Kh (Fig. 3); which means that the cold brittleness point was the same as usual in 35KhNM and 50KhN steel, and only by 5°C lower than usual in 55 Kh after a 10-hour holding. Increased forging temperature generally resulted in a slight drop of the cold brittleness threshold. The conclusion is drawn that heating to 30-40°C higher temperature than practiced (to 1,250°C for 55Kh, and 1,230°C for 50KhNM steel) did not impair the metal plasticity in deformation as well as the mechanical properties, provided that the entire forging process was completed with a single preheating, and the metal temperature at the end of the forging process was not too high (forging with intermediate reheats in same conditions

85130
S/182/60/000/004/001/007
A161/A029

The Effect of Hot Forging Conditions on the Properties of Large Forgings

has not been studied), and there is no reason for worry if ingots have to be held at forging temperature for a longer time. As to the tensile strength of steel, increased heating temperature and longer holding at this temperature does not impair it, and in separate cases it is even increased. There are 3 figures, 6 tables and 12 Soviet references.

Card 3/3

S/123/62/000/018/001/012
A006/A101

AUTHORS: Braun, M. P., Vinokur, B. B.

TITLE: The nature of chrome-nickel-columbium steel failure

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye; no. 18, 1962, 15, abstract 18A81 (In collection: "Metallovedeniye i term. obrabotka", Moscow - Kiyev, Mashgiz, 1961, 182 - 188)

TEXT: The authors studied the effect of Nb (0.1 - 0.9%) upon the structure of fracture of structural Cr-Ni and Cr-Mn-Ni steel. Alloying up to 0.6% Nb preserves ductile fractures down to low temperatures, and 0.7% Nb promotes the formation of brittle breaks.

[Abstracter's note: Complete translation]

Card 1/1

41558

S/148/62/000/008/005/009
E071/E483

18.8200

AUTHORS: Braun, M.P., Vinokur, B.B., Geller, A.L.

TITLE: The effect of additional alloying additions on hardenability of chromium-manganese steels

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.8, 1962, 128-134

TEXT: The range of application of Cr-Mn steels can be greatly increased by introducing additional carbide-forming alloying elements that improve their mechanical properties without adversely affecting their temper brittleness. To assess the suitability for the fabrication of large forgings of alloyed Ni-free Cr-Mn steels, it was necessary to compare their hardenability with that of other Ni-bearing materials used at present for this purpose - hence the present investigation conducted on the steels as shown in Table 1. Hardenability was determined by the standard Jominy end-quench test, its results being expressed in terms of both the critical diameter and the hardness/distance from the quenched end graphs. The 30Х2Г2МТ (30Kh2G2MT) and 30Х2ГМТ (30Kh2GMT) steels had the highest

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The effect of additional ...

hardenability which was so high that the critical diameter for these steels could not be calculated from data obtained on the standard specimens (25 mm in diameter). For the other steels the critical diameters were: 170 mm for 40XH (40KhN), 220 mm for 30XГВТ (30KhGVT) and 350 to 370 mm for 35XHM (35KhNM), 40XГВТ (40KhGVT) and 30XГВМ (30KhGVM). The ideal critical diameters, calculated by the method entailing the use of a multiplying factor for each alloying element are shown in Table 2. This method, while useful for screening purposes, is not very accurate. Much better results can be obtained by superimposing the cooling curves, constructed for various points on the cross-sections of specimens of various diameters, on the thermo-kinetic diagrams (as opposed to the TTT curves) of the martensitic transformation of the appropriate steels. By this means accurate information can be obtained not only on the critical diameter but also on the structure obtained under various conditions of specimen size and cooling rate. The use of this method was demonstrated on several of the steels studied, the appropriate diagrams being reproduced in the present paper.

The effect of additional ...

Conclusion: the steels 30Kh2G2MT and 30Kh2GMT could replace the Ni-bearing steels in the fabrication of large forgings. There are 2 figures and 2 tables.

ASSOCIATION: Ukrainskaya Akademiya sel'skokhozyaystvennykh nauk (Ukrainian Academy of Agricultural Sciences)

SUBMITTED: November 15, 1960

Table 1.

Сталь	C	Si	Mn	Cr	W	Mo	Ti	Ni	S	P
30ХГВТ	0,33	0,42	1,17	1,15	0,77	—	0,09	0,20	0,015	0,022
30ХГВМ	0,31	0,25	1,05	1,15	0,83	0,24	—	0,23	0,016	0,029
30Х2ГМТ	0,28	0,32	1,10	1,84	—	0,49	0,08	0,35	0,029	0,030
30Х2Г2МТ	0,31	0,47	1,52	2,05	—	0,35	0,12	0,21	0,020	0,028
40ХГВТ	0,41	0,53	0,96	1,21	0,82	—	0,08	0,23	0,016	0,030
40ХН	0,39	0,33	0,59	1,25	—	--	—	1,56	0,030	0,019
35ХНМ	0,37	0,24	0,69	1,65	—	0,29	—	1,73	0,029	0,019

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The effect of additional ...

Table 2.

Steel	Ideal critical diameter, mm For suppressing the pearlite transformation	For suppressing the intermediate transformation
30ХГВТ	591	296
30ХГВМ	715	136
30Х2ГМТ	885	310
30Х2Г2МТ	1440	570
40ХГВТ	617	200
40ХН	246	207
35ХНМ	485	203

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S/123/62/000/015/001/013
A052/A101

AUTHOR: Vinokur, B. B.

TITLE: Heat resistance of various alloyed steels

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 15, 1962, 19, abstract 15A107 (In collection: "Metallovedeniye i term. obrabotka". Moscow-Kiyev, Mashgiz, 1961, 215 - 224)

TEXT: Mechanical properties (stress limit at room and elevated temperatures up to 700°C, creep, rupture strength, stress relaxation and thermal brittleness) of four grades of steel were studied: 35 XM (35KhM) (0.26% Mo), 35 XH3M (35KhN3M) (0.32% Mo), 35 XГНВ (35KhGNV) (0.90% Mn and 0.52% W) and 35 XГН3В (35KhGN3V) (0.80% Mn and 0.42% W). An additional alloying with Mn and W improves their mechanical properties and reduces the tendency to temper brittleness. At a short-time testing no difference in properties of investigated steels is observed. The drop of stresses in Cr-Mn-Ni-W steels is greater than in Cr-Ni-Mo steels, for which reason the former steels are not used for manufacturing fastening elements. As a result of creep and thermal brittleness tests, 35KhGNV steel is recommended for

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S/123/62/000/015/001/013
A052/A101

Heat resistance of various alloyed steels

work at 400 - 500°C. It is advisable to raise the W content up to 1%.

[Abstracter's note: Complete translation]

Card 2/2

S/137/62/000/001/149/237
A006/A101

AUTHORS: Braun, M.P., Vinokur, B.B., Matyushenko, N.I., Manuylova, V.P.

TITLE: The effect of plastic deformation on the structure of heat resistant ЭИ 726 (EI726) steel

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 1, 1962, 41-42, abstract 1I288 (V sb. "Stal'", Moscow, Metallurgizdat, 1961, 478 - 489)

TEXT: The authors investigated the effect of temperature of hot plastic deformation on grain size of EI726 steel, containing in %: Ni 17, Cr 15, W 2, Nb 1-3, micro-admixtures of B and Ce. Specimens of a 16 ton ingot, 30 mm in diameter, and 60 mm high, were subjected to upsetting under heat-insulating conditions at 1,170 - 800°C with 15 - 75% deformation degree. Temperatures and deformation degrees were determined when surface roughness of the specimens observed, passed over into bulgings and cracks ("orange skin"). The optimum deformation degree is 30 - 45%. It is recommended to complete deformation at 900 - 1,000°C; at higher temperatures dendrites are crushed insufficiently; at lower temperatures deformation resistance increases and relaxation processes become more difficult; as a result, excessive grain growth takes place during the subsequent heating.

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The effect of plastic deformation ...

The authors investigated also the microstructure of specimens after holding at 1,080°C for 5 hours with subsequent cooling in water. Grain growth versus temperature and deformation degree is plotted in three-dimensional diagrams; the most uniform grains (4 - 5 points) over the whole height were observed both immediately after deformation and repeated heating under the aforementioned deformation conditions. For EI726 ingots the deformation degree should not exceed 40%. There are 5 references.

Ye. Bukhman

[Abstracter's note: Complete translation]

Card 2/2

S/737/61/000/000/010/010

AUTHORS: Braun, M.P., Doctor of Technical Sciences, Professor, Yinokur, B.B., Matyushenko, N.I., Manuylova, V.P., Engineers.

TITLE: The effect of plastic deformation on the structure of heat-resisting steel ЭИ 726 (EI726).

SOURCE: Stal', sbornik statey. Ed. by A. M. Yampol'skiy. Moscow. 1961, 478-489.

TEXT: An investigation was made of the heat-resisting steel ЭИ 726 (EI 726) with the following % composition (B and Ce calculated): C 0.12, Mn 1.58, Si 0.59, Ni 16.97, Cr 15.09, W 2.00, Nb 1.31, S 0.018, P 0.018, B 0.025, Ce 0.02%. In austenitic steels heating and cooling does not produce any polymorphic transformations, and plastic deformation is one of the principal factors in controlling the grain size. Inasmuch as in actual production different portions of an ingot undergo deformation at different temperatures, it is advisable to investigate the plasticity of the metal at various descending temperatures. Tests were made by the upsetting method. The specimens were initially 30 mm dia and 60 mm high. The specimens were insulated with asbestos sheathing to minimize radiative losses during thermal upsetting. Upsetting of specimens heated to 1170°C was done step by step to 15, 30, 45, 60, and 75%; this was followed by water cooling. The furnace temperature was then reduced step by step to 1100, 1000, 900, and 800°, and in each instance a batch of the specimens remaining in the furnace was subjected to upsetting, except for one control specimen which was water-cooled without any impact test. Microscopic in-

Card 1/3

spection before and after aqua-regia etching reveals a growing coarseness consisting of a network of mutually intersecting 45° shear lines, accompanied by the formation of external "orange peel." Such coarseness attains a maximum at 45% deformation; at 60% deformation fissures begin to form (photographs are shown). At lower temperatures (900°) coarseness increases for a given % deformation, and fissures appear at 45%. At 800°, heavy coarseness appears at 30% deformation. The test specimens were axially sectioned, the section slices were etched electrolytically for 20 sec in concentrated HNO_3 at 0.3 a/cm^2 and were examined under the microscope. The impaired diffusion in the highly alloyed steel and the rapid deformation and subsequent water cooling slow down the recrystallization process; hence, the specimens evince a dendritic structure; the dendritic structure is increasingly distorted with increasing % deformation. The distribution of the nonuniform deformation was determined stereoscopically by Saltykov's method (no reference). Thus, in specimens having undergone a total deformation of 45%, the deformation in the surface layers of the facial plane was only 30%, at 1/6 of the height 45%, and at the midpoint 66%. The dendrites near the faces, which are constrained by the friction with the impact tool, are deformed but little; at the midpoint the deformation (at temperatures up to 1170°) may be so complete that the structure becomes unidentifiable, except for a highly directional texture (photograph shown). At higher temperatures the dendrites are deformed considerably less; hence, the upsetting operation should not be terminated at high temperatures; on the other hand, the deformation

should not be completed at lower temperatures, where the plasticity of the metal is reduced and the relaxation processes are so impaired that any subsequent heating may result in a collective recrystallization. A most uniform structure with grain sizes of between 4 and $8 \cdot 10^{-3}$ μ^2 without disruption of the continuity of the metal are obtained by upsetting deformations of 30-45% at temperatures of 900-1000°C (photographs shown). Three-dimensional diagrams of grain size versus % deformation and temperature are shown. The effect of subsequent heating on the recrystallization of deformed specimens was investigated by holding them for 5 hours at 1080° and then water-quenching them. Electrolytic etching revealed new, smaller, polycrystalline grains and strong disintegration of the old, larger, dendritic grains. 15% deformation at 1170° may permit some growth of the grain; greater deformation at less than 1000° crushes the grain effectively. Heating after deformation evens out the grain size and eliminates any texture; however, the sectional size of the grains still depends on the size of the deformed dendrites. It is found and recommended that EI 726 steel should be deformed by upsetting to an extent not to exceed 40% at temperatures not below 900°. There are 7 figures and 5 references (all Russian-language, of which 2 are Soviet and 3 appear to be Russian translations of Western books).

ASSOCIATION: Institut liteynogo proizvodstva AN USSR, Ukrainskaya akademiya s.-kh. nauk, Novokramatorskiy mashinostroitel'nyy zavod (Institute of Foundry Production AS UkrSSR, Ukrainian Academy of Agricultural Sciences, New Kramatorsk Machine-Building Factory).

S/743/62/000/001/001/008

AUTHORS: Vinokur, B.B., Braun, M.P.

TITLE: The transformation of austenite in chrome-manganese- and chrome-nickel-based steels.

SOURCE: Struktura i svoystva litykh splavov. no.1. Inst. lit. proizv. AN USSR. Kiev, Izd-vo AN UkrSSR, 1962, 18-26.

TEXT: The paper reports the results of an experimental investigation of high-strength quench-hardenable steels with reference to the austenite transformation. It concludes that the kinetics of the transformation of supercooled austenite during continuous cooling and under isothermal conditions is identical for Cr-Ni and Cr-Mn steels, and that these two types of alloyed steels are, therefore, interchangeable. In either type of steel the isothermal diagram is fairly complicated: Two minimums of austenite stability, corresponding to the perlitic and intermediate regions, are observed, and between them a region of elevated stability of supercooled austenite prevails. Of the two steels, the critical cooling rates for the attainment of the perlitic and bainitic transformations are smaller in the Cr-Mn steel, i.e., this steel possesses a somewhat greater deep hardenability. If a Cr-Mn-Ni steel is further alloyed with W, the kinetics of the austenite transformation is analogous

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to the kinetics of the transformations of Cr-Ni-Mo steel with a Ni content up to 3%. The presence in a Cr-Ni steel of Mo is conducive not only to a greater austenite stability in the perlitic and intermediate regions, but increases its stability in the T interval from 510-575°C likewise, so that no decomposition of supercooled austenite is observed after isothermal .36-hr soaking. Comparative data (tabulated) indicate that steels with 2 or 3 alloying elements increase, at times by several tens of times, the stability of the austenite in the perlitic and especially in the intermediate region, and invariably decrease the critical rates of perlitic and bainitic hardenability and also the minimal rate for the completion of bainitic transformation (data tabulated). The multiply-alloyed steels 30XГBT (30KhGVT) and 30X2ГMT (30KhGMT) and the Ni-containing steels 35XHM (35KhNM) and 35XN2M (35KhN2M), in all of which the austenite is highly stable, appear mutually interchangeable for machine parts of large cross-section, since the alloying elements in these steels exert identical effects on the kinetics of the austenite transformation. The thermokinetic and isothermal diagrams and the effect exerted by the alloying elements on the strength, plasticity, toughness, and temper-brittleness tendency of steels, can serve for the accurate establishment of the maximum permissible sizes of machine parts in which the necessary properties can be obtained. The analysis of the austenite-transformation diagrams was usefully employed to select a steel that does not contain high-cost, scarce, alloying elements. Thus, multiple alloying was used

The transformation of austenite in chrome-manganese ... S/743/62/000/001/001/008

to obtain a high-strength steel without Ni. The steel developed was the 30KhGVT which replaces not only the steel 40XH (40KhN) for parts of any size, but also steel 30KhNM for parts up to 500 mm in cross-sectional size. For highly stressed parts in which 35KhNM steel is currently used, steel 30Kh2GMT was developed, which because of its excellent hardenability and other properties can also be used to replace steel 35KhN2M. There are 5 figures, 2 tables, and 6 Russian-language Soviet references.

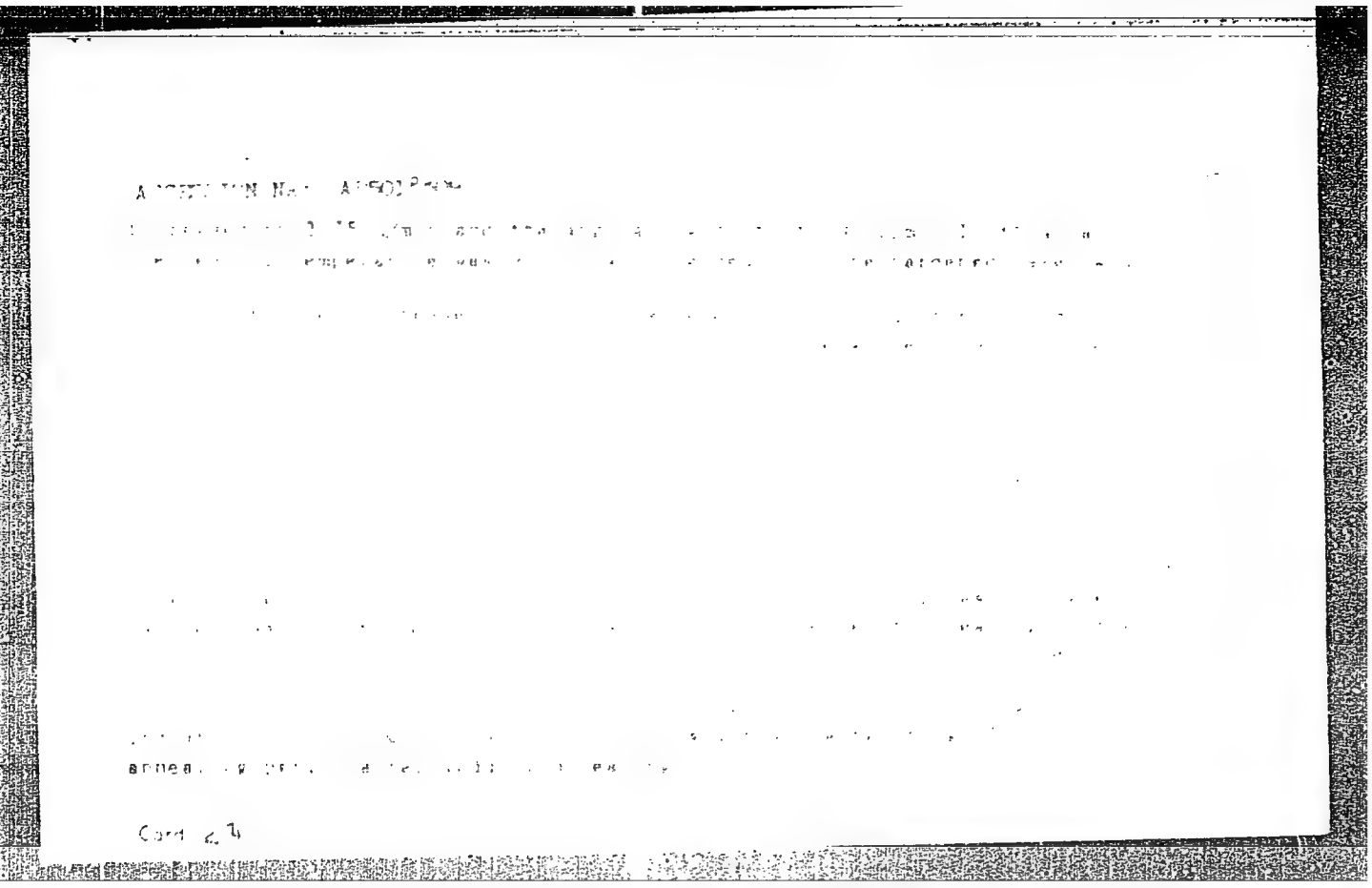
ASSOCIATION: Institut liteynogo proizvodstva, AN USSR (Institute of Casting Production, AS UkrSSR).

Card 3/3

AUTHOR: Braun, M. P. (Doctor of technical sciences); Kondrashev, A. I. (Engineer);
Vinokur, B. B. (Candidate of [illegible] sciences)

TITLE: [illegible] as of complex alloyed steels for large induction hardened products

SOURCE: Mashinostroyeniye, no. 5, 1964, 40-47



ACCESSION NR: AP5018809

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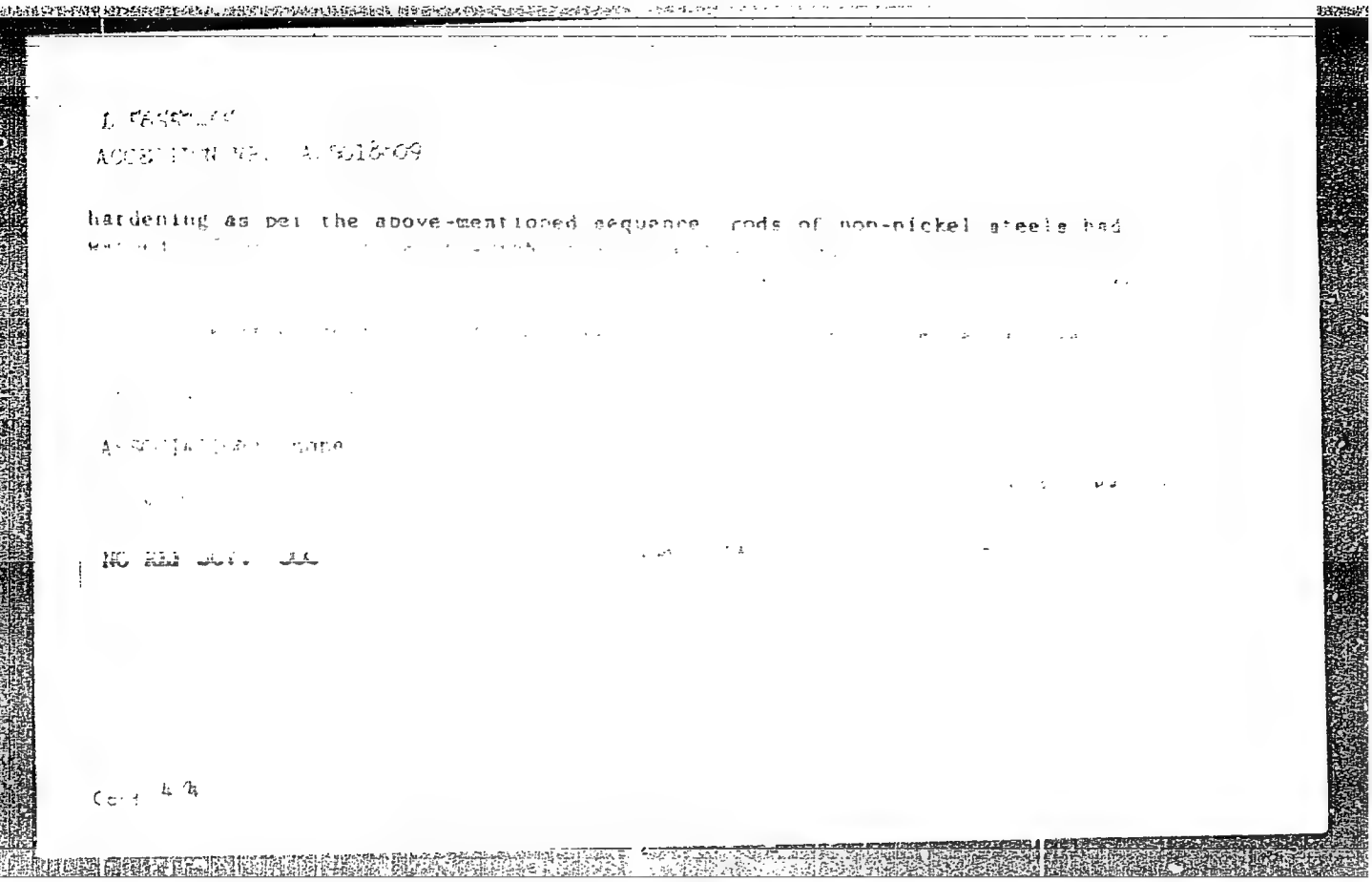

L. [illegible]
ACCESSION NR: [illegible]

hardening as per the above-mentioned sequence rods of non-nickel steels had

[illegible]

[illegible]

[illegible]

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S/743/62/000/001/002/008

AUTHORS: Vinokur, B.B., Braun, M.P.

TITLE: The hardenability of multiply-alloyed chrome-manganese steel.

SOURCE: Struktura i svoystva litykh splavov. no.1. Inst. lit. proizv. AN USSR. Kiev, Izd-vo AN UkrSSR, 1962, 36-44.

TEXT: The paper reports the result of an experimental investigation of the scale factor on the hardenability in the production of large machine parts. The direct objective of the investigation was the development of a Ni-free high-strength, hardenable, steel by means of the supplementary alloying of Cr-Mn steel by carbide-forming elements, which would help to achieve a high level of mechanical properties without incurring appreciable temper-embrittlement. It was found that the hardenability of multiply-alloyed Cr-Mn steel is so deep that a critical diameter was not attainable with the use of a plane-faced specimen 25 mm in diam. A comparison of the curves of the lengthwise change in hardness shows that the Cr-Mn-Ti steels 30X2Г2MT (30Kh2G2MT) and 30X2ГMT (30Kh2GMT) possess the greatest hardenability. The hardenability of steels 30KhGVM, 40KhGVT, and 35KhNM are identical. Steel 30KhGVT is slightly less hardenable; its hardness-variation curve is some 7-9 units of R_C lower than that for 40KhGVT. Steel 40KhN is least deep-hardenable. A second method for the determination of the hardenability, namely, the calculational method using factors, was employed. This method consists in expressing the hardenability of a given steel by the number 1 plus a factor times the % of an individual

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alloying element. Using the ideal critical diameter of a pure FeC alloy, which depends on the size of the austenite grain and the C content, and multiplying this initial quantity by the respective multiplying factors for each element, the critical diam for a steel of a given composition can be established. The determination of the hardenability of the various steels investigated by means of this calculational method yields the same quality sequence of the various steels with respect to changes in hardenability. The steel 30Kh2GMT has a critical diam, with inhibition of the perlitic transformation at the center of the section, twice as great as that of steel 35KhNM and 3.5 times as great as steel 40KhN. The hardenability of the steels 35KhGVT is found to be twice as deep as for the steel 40KhN. It is found that the most accurate results for the determination of the hardenability of steels are obtained by overlaying the cooling curves of parts of different cross-section onto the thermokinetic diagrams for the steels, whereupon it is possible to determine not only the critical diameter but also the structure of the steel at any desired point of the cross-section. The hardenability investigation shows that Cr-Ni and Cr-Ni-Mo steels can be replaced by multiply-alloyed Cr-Mo-based steels without any Ni. There are 1 figure and 4 tables; no references.

ASSOCIATION: Institut liteynogo proizvodstva, AN USSR (Institute of Casting Production, AS UkrSSR).

S/743/62/000/001/005/008

AUTHORS: Geller, A.L., Braun, M.P., Vinokur, B.B.

TITLE: The effect of the pre-quench temperature on the properties of multiple-alloy steels.

SOURCE: Struktura i svoystva litykh splavov. no.1. Inst. lit. proizv. AN USSR. Kiev, Izd-vo AN UkrSSR, 1962, 76-81.

TEXT: The paper adduces the results of experimental investigations on Cr-Mn steels additionally alloyed by strongly carbide-forming elements, which lead to the formation of a complex alloyed carbide of the cementite type, which has a relatively low temperature of dissolution in austenite. It is found that a carbide-forming element is dissolved partly in the multiply-alloyed cementite. In this process the bonding forces between the element and the C are significantly weakened; this effect leads to a lowering of the dissolution temperature in the austenite of the alloyed carbide to a value that is lower than that of the individual carbide by itself but higher than that of the cementite. Secondly, a part of the element introduced combines with the C, forming a separate carbide of the type MeC (Me=metal), which is highly austenite-dissolution resistant. However, the formation of the separate carbide engenders separation of the parts of the alloyed cementite, i.e., the freeing

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of the alloying elements from the carbide and their transfer into the solid solution, which in turn compensates, as it were, for the loss of C and leads to a hardening of the solid solution and an elevation of its hardenability. The investigation was focused primarily on the determination of the effect of the pre-quench temperature on the degree of dissolution of the carbide-forming elements in the austenite by means of the dilatometric method. The influence of the pre-quench temperature on the position of the critical points during cooling are investigated for steels 30ХГВТ (30KhGVT), 30ХГВМ (30KhGVM), and 30Х2ГМТ (30KhGMT), and are shown graphically for cooling in the furnace and in air. It is found that, if steel is alloyed with a Ti-containing complex, the quench temperature for the obtainment of elevated mechanical properties with minimal tendency toward temper-brittleness must exceed the upper critical point by 80-100°C. It is concluded that steels 30KhGVT and 30Kh2GMT must be quenched from a temperature of 900° to obtain optimal mechanical properties and suppress temper-brittleness. An increase in pre-quench temperature from 850° to 920°, for example, improves the tensile strength by 13 kg/mm^2 and the yield limit by 16 kg/mm^2. There are 3 figures and 3 tables. No references.

ASSOCIATION: Institut liteynogo proizvodstva, AN USSR (Institute of Casting Production, AS UkrSSR).

BRAUN, M. P.; VINOKUR, B. B.; KONDRASHEV, A. I.; GELLER, A. L.

Search for a nickel-free structural steel. Izv. vys. ucheb. zav.; chern. met. 5 no.12:126-130 '62. (MIRA 16:1)

1. Ukrainskaya akademiya sel'skokhozyaystvennykh nauk.

(Steel, Structural—Testing)
(Chromium-manganese steel—Brittleness)

BRAUN, Mikhail Petrovich; VINOKUR, Bertol'd Bentsionovich

[Low-alloy and high-strength steels and their use in machine construction] Malolegovani i vysokomitsni stali ta ikh zastosuvannia v mashinobuduvanni. Kyiv, Vyd-vo Akad. nauk URSR, 1960. 78 p. (MIRA 16:4)
(Steel—Heat treatment) (Austenite)

BRAUN, M.P. (Kiyev); VINOKUR, B.B. (Kiyev); GELLER, A.G. (Kiyev); KONDRASHEV, A.I. (Kiyev)

Brittle failure of alloyed steels. Izv. AN SSSR. Otd. tekh. nauk. Met. i topl. no.4:43-49 Jl-Ag '61. (MIRA 14:8)
(Steel alloys—Brittleness)

BRAUN, Mikhail Petrovich; VINOKUR, Bertol'd Bentionovich; KONDRASHEV, Arkadiy Ivanovich; MAYSTRENKO, Yekaterina Yevdokimovna; GORSHKOV, A.A., otv.red.; REMENNIK, T.K., red.; BUNIY, R.A., tekhn.red.

[Mechanical properties, heat resistance and heat treatment of alloyed steel] Mekhanicheskie svoistva, teploustoichivost' i termicheskaia obrabotka legirovannoi stali. Kiev, Izd-vo Akad. nauk USSR, 1959. 190 p. (MIRA 13:4)

1. Chlen-korrespondent AN USSR (for Gorshkov).
(Steel) (Heat-resistant alloys)

BRAUN, M.P., doktor tekhn.nauk; VINOKUR, B.B., inzh.

Changes in properties of the 30KhGVT steel depending on tempering time. Mashinostroenie no.4:34-35 Jl-Ag '63. (MIRA 17:2)

ACCESSION NR: AT4022205 S/0000/63/000/000/0057/0062

AUTHOR: Vinokur, B. B.; Braun, M. P.

TITLE: Creep of steel containing molybdenum and tungsten

SOURCE: AN UkrRSR. Insty*tut ly*varnogo vy*robny*tstva. Konstruktsionny*ye i zharoprochny*ye splavy* (Structural and heat-resistant alloys). Kiev, Izd-vo AN UkrSSR, 1963, 57-62

TOPIC TAGS: creep, steel creep, molybdenum steel creep, tungsten steel creep, alloy, perlitic steel, chromium steel

ABSTRACT: Testing methods are divided into: isothermic, dilatometric and relaxation depending on the three factors causing creep (temperature, stress, strain). The last two methods differ from the first, since elongation due to creep is compensated by temperature variation (dilatometric) or stress (relaxation), i.e. by processes eliminating creep. Creep resistance is estimated by three methods: by the stress causing the given strain rate, by the stress causing a total strain for a given time and by stress leading to zero creep (creep limit). The creep rate of different alloys depends to a large extent on the temperature. Nickel alloys of perlitic steel lead to strengthening at low temperatures and to significant loss of strength at high temperatures. The creep limit of 35KhGNV steel at 450-500C

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ACCESSION NR: AT4022205

is relatively high and may be compared with the creep limit of chromium-nickel and chromium-nickel-molybdenum steel. Orig. art. has: 1 figure, 2 tables and 4 formulas.

ASSOCIATION: INSTY*TUT LY*VARNOGO VY*ROBNY*TSTVA AN UkrSSR (Institute of Manufacture, AN UkrSSR)

SUBMITTED: 00	DATE ACQ: 19Mar64	ENCL: 01
SUB CODE: ML	NO REF SOV: 005	OTHER: 000

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S/148/60/000/012/013/020
A161/A133

18.5100

AUTHORS: Braun, M. P.; Vinokur, B. B.; Mirovskiy, E. I., and Geller, A. L.

TITLE: The effect of the temperature and duration of heating on the properties of steel in large forging billets

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no. 12, 1960, 111 - 113

TEXT: As had already been proven, the deformation temperature can be raised [Ref. 1: M. P. Braun, O. S. Kostyrko et al. Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 1960, no. 2; Ref. 2: M. P. Braun, O. S. Kostyrko et al. "Kovka zagotovok iz stali 45 pri povyshennoy temperature nagreva" (Forging of 45 Grade Steel Blanks at High Heating Temperatures). Mashinostroyeniye i priborostroyeniye, BTI Kiyevskogo sovnarkhoza, 1959, no. 11 - 12], but the data were obtained with small-size forgings, and it is generally believed that the plasticity and ultimate strength of steel are lower in larger pieces (Refs. 4, 5, 6 see English-language publications). The purpose of the investigation described here was to study the

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The effect of the temperature and duration of ...

effect of higher than conventional heat on steel in large ingots. Stepped forgings were forged from ingots of the steel grades 55X (55Kh), heated to 1,250°C, 50XH (50KhN) and 35XHM (35KhNM), heated to 1,230°C, 960, 670 and 480 mm in diameter. No cracks originated during forging, and the entire forging process was finished with one heating, while such forgings have to be reheated in the forging process at heating temperatures used hitherto. The formation of flakes was prevented by isothermic annealing; 55Kh and 50KhN billets were subjected to normalization with tempering, and 35KhNM to thermic improvement. Disks 130 mm thick were cut out of the middle of forgings for mechanical tests. In 55Kh steel the strength varied only insignificantly through the different diameter steps - ultimate strength 86 - 78 kg/mm^2, yield limit 40 - 32 kg, impact resistance 2.8 - 3.6 kg/cm^2, but the difference in plasticity was higher - from 40% on the surface to 22% in the center in the axial direction. The variations of mechanical properties in 50KhN steel were analogous. Also in the 35 KhNM grade they were analogous but all the properties were higher than in 50KhN. The effect of the holding time at the forging temperature was also studied at the same time. This problem has not yet been clarified, and the holding time is chosen

The effect of the temperature and duration of...

empirically, e.g. the accepted holding time for 30 - 40-ton ingots is from 10 to 30 hrs. Holding for 10 and 30 hrs was tried in the tests. It was obvious that heating temperatures 30 - 40°C higher than prescribed in the forging technology of the Novo-Kramatorskiy mashinostroitel'nyy zavod (Novo-Kramatorsk Mechanical Engineering Plant) did not impair the mechanical properties of steel, and sometimes even improved them, and even in very large cross sections (up to 1,000 mm). Conclusions: 1) Heating of the 35KhNM and 50KhN steel to 1,230°C and of 55Kh steel to 1,250°C did not affect the plasticity in forging nor did it reduce the mechanical properties after the heat treatment; 2) Longer holding at higher forging temperatures did not deteriorate the mechanical properties of steel; 3) Higher forging temperatures and longer holding at such temperatures (up to 30 hrs) did not reduce the ductility of steel in large ingots, and even improved it in some instances through homogenation; 4) The use of higher heating temperatures for forging, speeds up the plastic deformation process, and deformation requires lower efforts. There are 12 references: 9 Soviet-bloc and 3 non-Soviet-bloc. The references to English-language publications read as follows: I. H. Holloman. Fracture and the Structure of Metals, TASM, 1949; W. P. Roop. Evolution for Structure Design of Laboratory Data of Flow and

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The effect of the temperature and duration of... S/148/60/000/012/013/020 23624 A161/A133

Fracture of Steel, TASM, 1949; I. D. Lukban. Notch Tensile Testing, TASM, 1949.

ASSOCIATION: Ukrainskaya akademiya sel'skokhozyaystvennykh nauk (The Ukrainian Academy of Agricultural Sciences)

SUBMITTED: October 29, 1959

Card 4/4

PHASE I BOOK EXPLOITATION SOV/5681

Braun, Mikhail Petrovich, Bertol'd Bentsionovich Vinokur, Eduard Ippolitovich Mirovskiy, Aleksandr L'vovich Geller, and Lev Grigor'yevich Mar'yushkin

Plasticheskaya deformatsiya i teplovaya obrabotka krupnykh izdeliy iz legirovannykh staley (Plastic Deformation and Heat Treatment of Large Alloy-Steel Products) Moscow, Mashgiz 1961. 216 p. 6,000 copies printed.

Reviewer: N. V. Fiksen, Engineer; Ed.: P. Ya. Furer; Tech. Ed.: M. S. Gornostaypol'skaya; Chief Ed.: (Southern Division Mashgiz) V. K. Serdyuk, Engineer.

PURPOSE : This book is intended for technical personnel of industrial plants and scientific research institutes.

COVERAGE: The theoretical principles of plastic deformation of steels and the role of manufacturing-process factors in deformation are discussed. Methods of studying metal plasticity

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at forging temperatures are described in detail along with results of investigations of the plasticity of various steels conducted by the authors under laboratory and shop conditions. Also described is a method of statistical analysis of processing parameters applied to determine the cause of defects caused by hot plastic deformation. The effect of the temperatures at the beginning and at the end of deformation, the degree of deformation, and test conditions on the structure and properties of medium-weight and heavy forgings is also analyzed. The following took part in the experimental studies: A. N. Sokol, Candidate of Technical Sciences; S. M. Skorodziyevskiy, Senior Scientific Worker; Engineers A. I. Kondrashev, Z. L. Oboznaya, B. D. Matyukhin, and A. A. Ivanova; Aspirants O. S. Kostyrko and N. K. Golubyatnikov; and Technicians L. N. Kovalenko and S. M. Simonova. There are 62 references, all Soviet.

PHASE I BOOK EXPLOITATION SOV/5511

Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Kiyevskoye oblastnoye pravleniye.

Metallovedeniye i termicheskaya obrabotka (Physical Metallurgy and Heat Treatment of Metals) Moscow, Mashgiz, 1961. 330 p. Errata slip inserted. 5,000 copies printed.

Sponsoring Agency: Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta Ministrov UkrSSR. Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Kiyevskoye oblastnoye pravleniye.

Editorial Board: M. P. Braun, Doctor of Technical Sciences, I. Ya. Dekhtyar, Doctor of Technical Sciences, D. A. Draygor, Doctor of Technical Sciences, I. S. Kamenichnyye, Engineer, Ye. A. Markovskiy, Candidate of Technical Sciences, V. G. Permyakov, Doctor of Technical Sciences, and A. V. Chernovol, Candidate of Technical Sciences; Ed.: M. S. Soroka; Tech. Ed.: M. S. Gornostaypol'skaya; Chief Ed., Mashgiz (Southern Dept.): V. K. Serdyuk, Engineer.

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PURPOSE: This collection of articles is intended for scientific workers and technical personnel of research institutes, plants, and schools of higher technical education.

COVERAGE: The collection contains papers presented at a convention held in Kiyev on problems of physical metallurgy and methods of the heat treatment of metals applied in the machine industry. Phase transformations in metals and alloys are discussed, and results of investigations conducted to ascertain the effect of heat treatment on the quality of metal are analyzed. The possibility of obtaining metals with given mechanical properties is discussed, as are problems of steel brittleness. The collection includes papers dealing with kinetics of transformation, heat treatment, and properties of cast iron. No personalities are mentioned. Articles are accompanied by references, mostly Soviet.

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26584

S/148/61/000/006/008/013
E111/E480

AUTHORS: Braun, M.P., Vinokur, B.B. and Kondrashev, A.I.

TITLE: Influence of niobium on the form of fracture of alloyed structural steel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1961, No.6, pp.119-124

TEXT: Numerous investigations into the fracture of steel hardened and then tempered at 500 to 650°C with very rapid or very slow cooling showed that the forms of fracture after impact testing at +300 to -200°C can in the main be classified in five groups. The author used this classification in studying the effect of niobium on the form of fracture in structural chromium-nickel and chromium-manganese-nickel steels. The following compositions were tested

		C	Mn	Si	Cr	Ni	Nb	S	P
Cr—Ni—Nb	*B*	0,30	0,35	0,13	1,29	1,52	0,33	0,032	0,16
Cr—Ni—Nb	*C*	0,33	0,40	0,31	1,27	1,57	0,71	0,020	0,020
Cr—Ni—Nb	*K*	0,35	0,41	0,27	1,31	1,57	0,90	0,037	0,020
Cr—Ni—Mn—Nb	*A*	0,36	0,99	0,30	1,01	1,58	0,10	0,018	0,022
Cr—Si—Mn—Nb	*B*	0,25	1,25	1,07	1,33	0,21	0,09	0,019	0,022

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Impact specimens were oil-quenched from 860 and 1000°C and tempered at 500, 550, 600 and 650°C with subsequent cooling in water at 20°C to give a ductile, and in the furnace (at 0.3°C/min) to give a brittle, initial state. Impact tests were effected at +300°C to -200°C. The results showed that alloying of chromium-nickel steel with niobium to over 0.7% greatly impairs the form of fracture. (Abstractor's note: This is in the authors' own words although the next sentence suggests "improves".) Curves of toughness (kgm/cm^2) as a function of test temperature (°C) for the steel C (S), tempered at 500, 550, 600 and 650°C, confirm the indications given by the form of fracture and show the satisfactory toughness and the low tendency to reversible temper brittleness (Fig.4: plots a, б, в, г - oil quenched from 800°C; plot д - oil quenched from 1000°C; curves 1 - tough state, curves 2 - brittle state). To find the effect of holding time on the form of fracture, impact test pieces of steels Б (B), S and K, oil-quenched from 860°C and tempered for 2 hours (650°C, and cooling), were held for 50, 100, 500 and 1000 hours at 650°C and then tested at +300 to -200°C. The general conclusion from the work is that

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Influence of niobium on the form ... E111/E480

alloying of the test steels with 0.1% Nb does not affect the fracture; with 0.3 to 0.6% the ductile fracture is preserved to low test temperatures irrespective of the initial state of the steel; with over 0.7%, brittle crystalline fractures are produced. With over 0.9% grains of niobium carbide are visible in the microstructure but these should increase rather than decrease plasticity. Crystal fragments in ductile fractures could be due to enrichment of some crystal planes with carbon and alloying elements. The most surface active elements are probably carbon, silicon, phosphorus and aluminium with respect to austenite, and phosphorus, silica, nickel, manganese and chromium with respect to ferrite. The quantitative calculation of the adsorption effect has been described by M.P.Braun in his book "Izlom i khrupkost' konstruktsionnoy legirovannoy stali" (Fracture and Brittleness of Structural Alloy Steel), Mashgiz, 1960. There are 5 figures, 1 table and 1 Soviet reference.

ASSOCIATION: Institut litoynogo proizvodstva AN UkrSSR i NKMZ im. Stalina (Foundry Production Institute AS UkrSSR and NKMZ imeni Stalin)

Card 3/3

BRAUN, M.P., doktor tekhn.nauk; VINOKUR, B.B., inzh.

Optimum conditions for annealing 30KhGVT steel. Mashinostroenie no. 2:57-59 Mr-Ap '64. (MIRA 17:5)

S/137/62/000/002/076/114
A006/A101

AUTHORS: Braun, M. P., Vinokur, B. B., Geller, A. G., Kondrashev, A. I.

TITLE: On brittle failure of alloyed steel

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 2, 1962, 37, abstract 2I221 ("Izv. AN SSSR, Otd. tekhn. n.", 1961, no. 4, 43 - 49)

TEXT: The authors studied sensitivity to brittle failure of complex-alloyed Cr-Mn-base steels, such as 30ХГВТ (30KhGVT), 30ХГВМ (30KhGVM) and 30Х2ГМТ (30Kh2GMT), and carried out comparison tests of two Cr-Ni base steel grades: 40ХН (40KhN) and 30ХНМ (30KhNM). Cr-Mn steels containing 0.3% C and additionally alloyed with a complex of carbide-forming elements, and Cr-Ni-Mo steels show the same sensitivity to brittle failure under the effect of stress concentration. KhGVT, 30KhGVM and 35KhNM steels have an almost equal proneness to brittleness. Highest brittleness under the effect of a notch is shown by 40KhN steel. Tests by the method of static bending of notched specimens of rectangular section make it possible to estimate the proneness of steel to failure under the effect of a notch and to temper-brittleness. In 30KhVGM steel an increase of brittle sensitivity is observed when using this test method. Dynamic tests at low tempera-

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On brittle failure of alloyed steel

S/137/62/000/002/076/144
A006/A101

tures of 30KhGVT, 30KhGVM and 30Kh2GMT steels show that the sensitivity to temper brittleness of these steels is almost similar. 30KhN steel is characterized by higher sensitivity to temper brittleness. 30 KhGVT and 30Kh2GMT steels are recommended for intricate-shaped machine parts.

T. Rumyantseva

[Abstracter's note: Complete translation]

Card 2/2

39656
S/137/62/000/007/043/072
A057/A101

18 1130

AUTHOR: Vinokur, B. B.

TITLE: Resistance to heat of various alloyed steels

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1962, 56, abstract 7I341 (In collection: "Metallovedeniye i term. obrabotka". Moscow-Kiyev, Mashgiz, 1961, 215 - 224)

TEXT: Steels of the type 35 ХМ (35KhM), 35 ХГНВ (35KhGNV), 35 ХГН 3 В (35KhGN3V), and 35 ХН 3 В (35KhN3V) were investigated. Alloying of the steel with Mn and W decreases the rate of creep, therefore steel of the type 35KhGNV with the composition (in %): C 0.39, Mn 0.9, Ni 0.03, Cr 0.77, W 0.52, Si 0.32, S 0.019, P 0.02 - is equivalent with the steel alloyed with Mo, 35KhM (C 0.37, Mn 0.56, Ni 0.25, Cr 0.92, Mo 0.26, Si 0.31, S 0.027, P 0.025) and 35 KhM. Stresses relax quicker in the Cr-Mn-Ni-W-steel than in Cr-Ni-Mo-steel, hence the former cannot be used for production of fastening articles. Thermal brittleness did not appear in steel 35KhGNV and 35KhM during 3,000 hrs. Considerable development of brittleness was observed in steel 35KhN3M and specially in steel 35KhGN3V of the composition (in %): C 0.36, Mn 0.8, Ni 2.84, Cr 1.14, W 0.42, Si 0.3, S 0.02, P 0.025.

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S/137/62/000/007/049/072
A057/A101

Resistance to heat of various alloyed steels

An increased content of Ni affects negatively the heatproof characteristics of steel 35KhN3M and especially at a low content of W, steel 35KhGN3V.

T. Rumyantseva

[Abstracter's note: Complete translation]

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BRAUN, Mikhail Petrovich; VINOKUR , Bertol'd Bentsionovich; CHERNOVOL, Arkadiy Vasil'yevich; CHERNYY, Viktor Gavrilovich; ALEKSANDROV, Anatoliy Grigor'yevich; KOSTYRKO, Oleg Stepanovich; ALEKSANDROVA, Natal'ya Pavlovna; LYASHENKO, Lyudmila Aleksandrovna; MATYUSHENKO, Nelli Ivanovna; FIKSEN, N.V., kand. tekhn. nauk, otv. red.; POKROVSKAYA, Z.S., red.; DAKHNO, Yu.B., tekhn. red.

[Structural and heat-resistant alloys] Konstruktsionnye i zharoprochnye splavy. Kiev, Izd-vo AN USSR, 1963. 149 p. (MIRA 17:3)

1. Akademiya nauk URSR, Kiev. Instytut lyvarnoho vyrobnytstva.

EWT(d)/EWA(d)/T/EWP(t)/EWP(k) LIP(c) JD/HW

SOURCE CODE: UR/0304/65/000/006/0087/0088

AUTHORS: Braun, M. P. (Doctor of technical sciences); Vinokur, B. B. (Candidate of technical sciences)

ORG: none

TITLE: Resistance of steels to fatigue failure

SOURCE: Mashinostroyeniye, no. 6, 1965, 87-88

TOPIC TAGS: steel, material strength, fatigue limit, fatigue strength, material testing, metal test

ABSTRACT: A study was made of the resistance of steels to fatigue failure. It is noted that fatigue failure is not accompanied by noticeable plastic deformation. However, microscopic analysis always shows shear lines. The plastic deformed zone changes the character of the stress distribution along a section of the specimen. This leads to variation of the value of the moment of internal forces equalizing these stresses. The errors and misconceptions associated with the use of conventional fatigue computations based upon the flow limits are discussed. An experimental determination of the fatigue limit is recommended, particularly for high-strength steel alloys. A comparison of the fatigue strength of eight steel alloys is given, showing the comparative values of strength as computed by five formulas and the

UDC: 539.431:669.15

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fatigue limits found by laboratory testing. The steels compared are 40KhN, 35KhM, 35KhNM, 34KhN3M, 30KhGVT, 30Kh2GMT, 35KhGNV, and 35KhGN2V, which were tested on a Shenka testing machine. Two additional steels, 5KhGSNT and 20KhN3A were similarly compared after fatigue testing on an NU machine. Orig. art. has: 5 equations and 2 tables.

SUB CODE: 11/

SUBM DATE: none

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BRAUN, Mikhail Petrovich; VINOKUR, Bertol'd Bentsionovich; MIROVSKIY, Eduard Ippolitovich; GELLER, Aleksandr L'vovich; MAR'YUSHKIN, Lev Grigor'yevich; FIKSEN, N.V., inzh., retsenzent; FURER, P.Ya., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn. red.

[Plastic deformation and heat treatment of large steel alloy parts] Plasticheskaia deformatsiia i teplovaia obrabotka krupnykh izdelii iz legirovannykh stalei. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1961. 216 p. (MIRA 14:7)

(Steel forgings) (Deformations (Mechanics))

BRAUN, Mikhail Petrovich; VINOKUR, Bentsikhanovich; KONDRASHEV, Arkadiy Ivanovich; GELLER, Aleksandr L'vovich; FIKSEN, N.V., kand. tekhn. nauk, retsenzent; FURER, P.Ya., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn.red.

[Properties of complex-alloy steel for the manufacture of large-section parts] Svoistva kompleksnolegirovannykh stalei dlia izdelii krupnykh sechenii. Moskva, Mashgiz, 1963. 207 p. (MIRA 16:8)

(Steel alloys--Testing)
(Machinery--Design and construction)

BRAUN, Mikhail Petrovich; VINOKUR, Bertol'd Bentsionovich; CHERNYY, Viktor Gavrilovich; CHERNOVOL, Arkadiy Vasil'yevich; KOSTYRKO, Oleg Stepanovich; ALEKSANDROVA, Natal'ya Pavlovna; KRUKOVSKAYA, Galina Nikolayevna; TIKHONOVSKAYA, Larisa Dmitriyevna; LYASHENKO, Lyudmila Aleksandrovna; FIKSEN, N.V., kand. tekhn. nauk, otv. red.; POKROVSKAYA, Z.S., red.; KADASHEVICH, O.A., tekhn. red.

[Alloys with addition elements] Legirovannye splavy. [By] M.P. Braun i dr. Kiev, Izd-vo AN Ukr.SSR, 1963. 142 p. (MIRA 16:8)

(Alloys--Metallurgy)
(Foundries--Equipment and supplies)

BRAUN, M.P., doktor tekhn. nauk; VINOKUR, B.B., inzh.; KONDRASHEV, A.I., inzh.; ZASLAVSKIY, S.Sh., otv. za vyp.

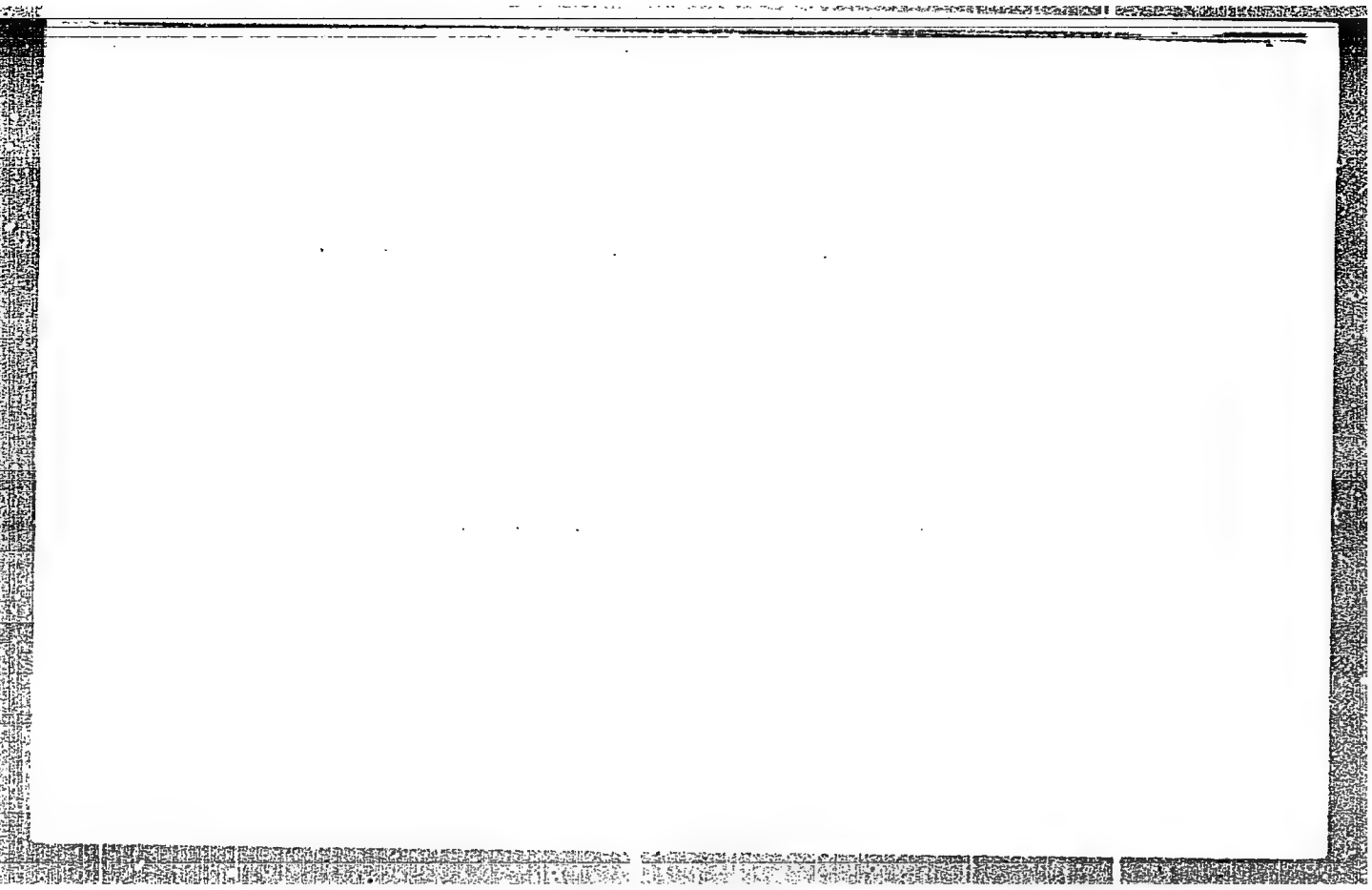
[Properties of chromium-nickel steel with an addition of niobium] Svoistva khromonikelevoi stali, legirovannoi niobiem. Kiev, Gos.nauchno-tekhn. kom-t Soveta Ministrov USSR, 1959. 14 p. (MIRA 16:7)

1. Ukrainskaya akademiya sel'skokhozyaystvennykh nauk (for Braun, Vinokur). 2. Novo-Kramatorskiy mashinostroitel'nyy zavod im. Stalina (for Kondrashev).
(Chromium-nickel steel)

BRAUN, M.P.; VINOKUR, B.B.; IVANOV, F.I.

Transformations of undercooled austenite in steels with a varying degree of alloying. Izv.vys.ucheb.zav.; chern.met. 6 no.1:128-135 '63. (MIRA 16:2)

1. Ukrainskaya akademiya sel'skokhozyaystvennykh nauk.
(Steel alloys—Metallography) (Phase rule and equilibrium)



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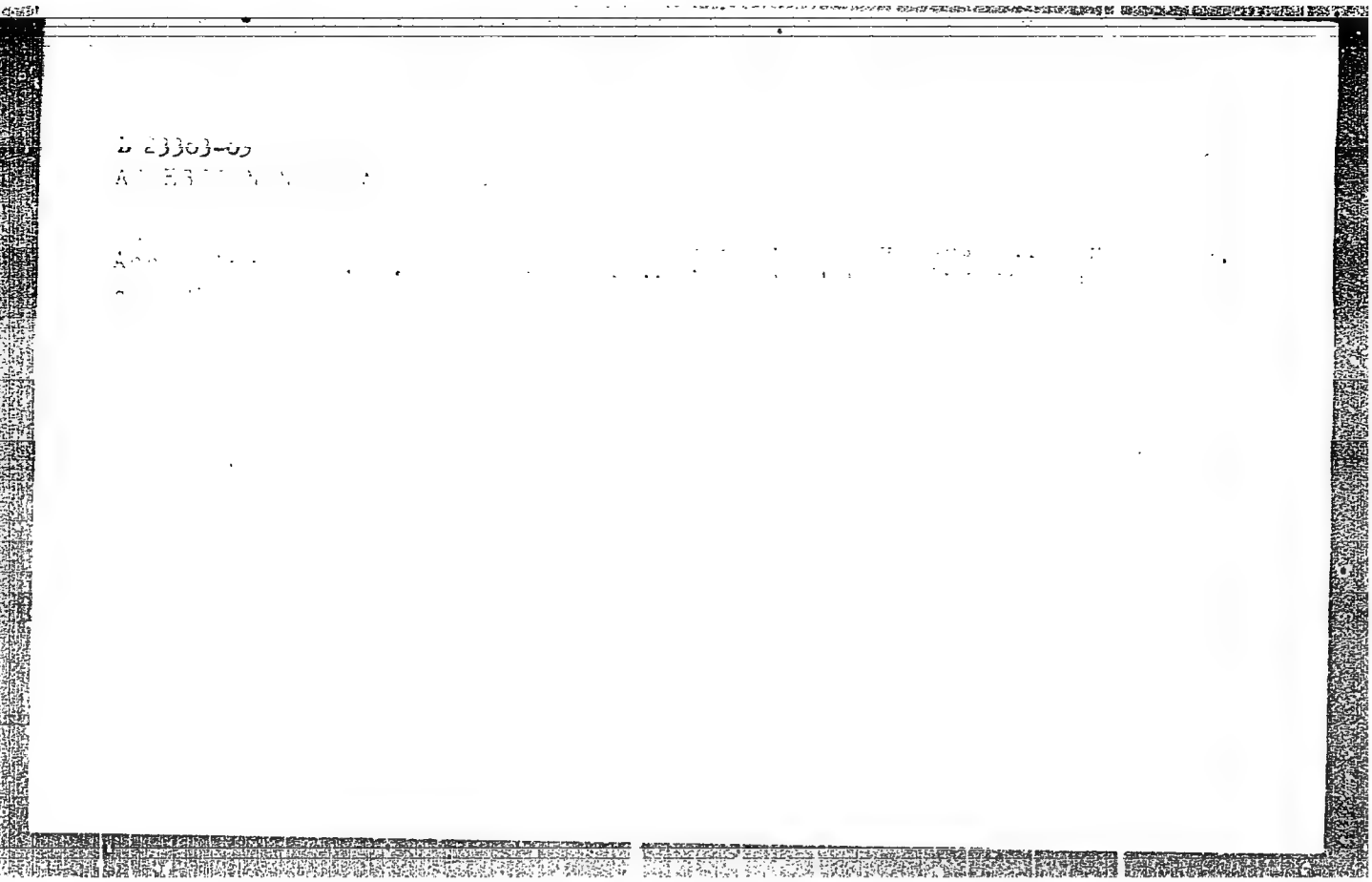
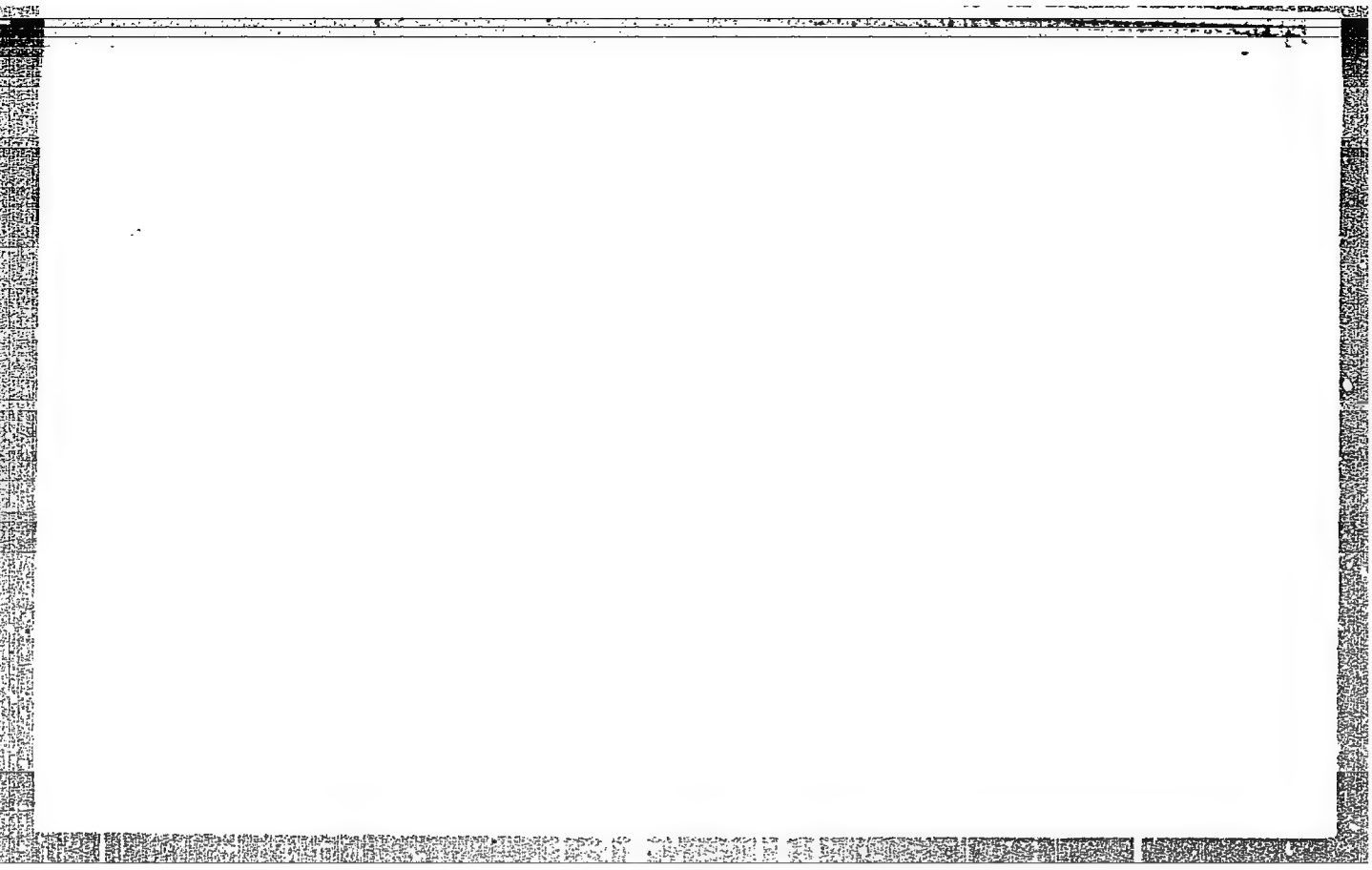


BRAUN, Mikhail Petrovich; VINOKUR, Bertol'd Bentsionovich; CHERNOVOL, Arkadiy Vasil'yevich; CHERNYY, Viktor Gavrilovich; ALEKSANDROV, Anatoliy Grigor'yevich; KOSTYRKO, Oleg Stepanovich; ALEKSANDROVA, Natal'ya Pavlovna; LYASHENKO, Lyudmila Aleksandrovna; MATYUSHENKO, Nelli Ivanovna; FIKSEN, N.V., kand. tekhn. nauk, otv. red.; POKROVSKAYA, Z.S., red.

[Structural and heat-resistant alloys] Konstruktsionnye i zharoprochnye splavy. Kiev, Izd-vo AN USSR, 1963. 149 p. (MIRA 17:3)

1. Akademiya nauk URSR, Kiev. Instytut liteynogo proizvodstva.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860010014-0"



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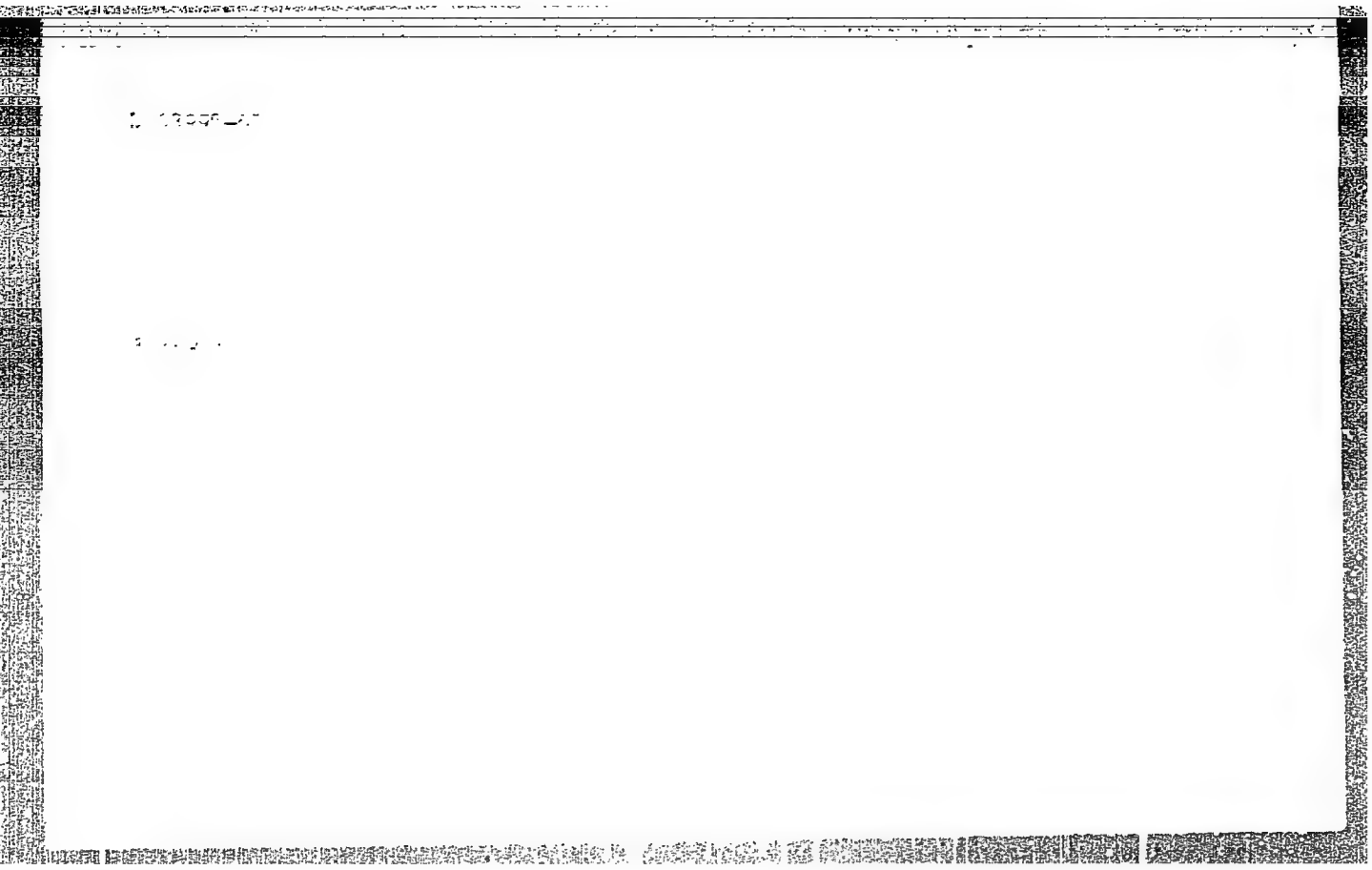
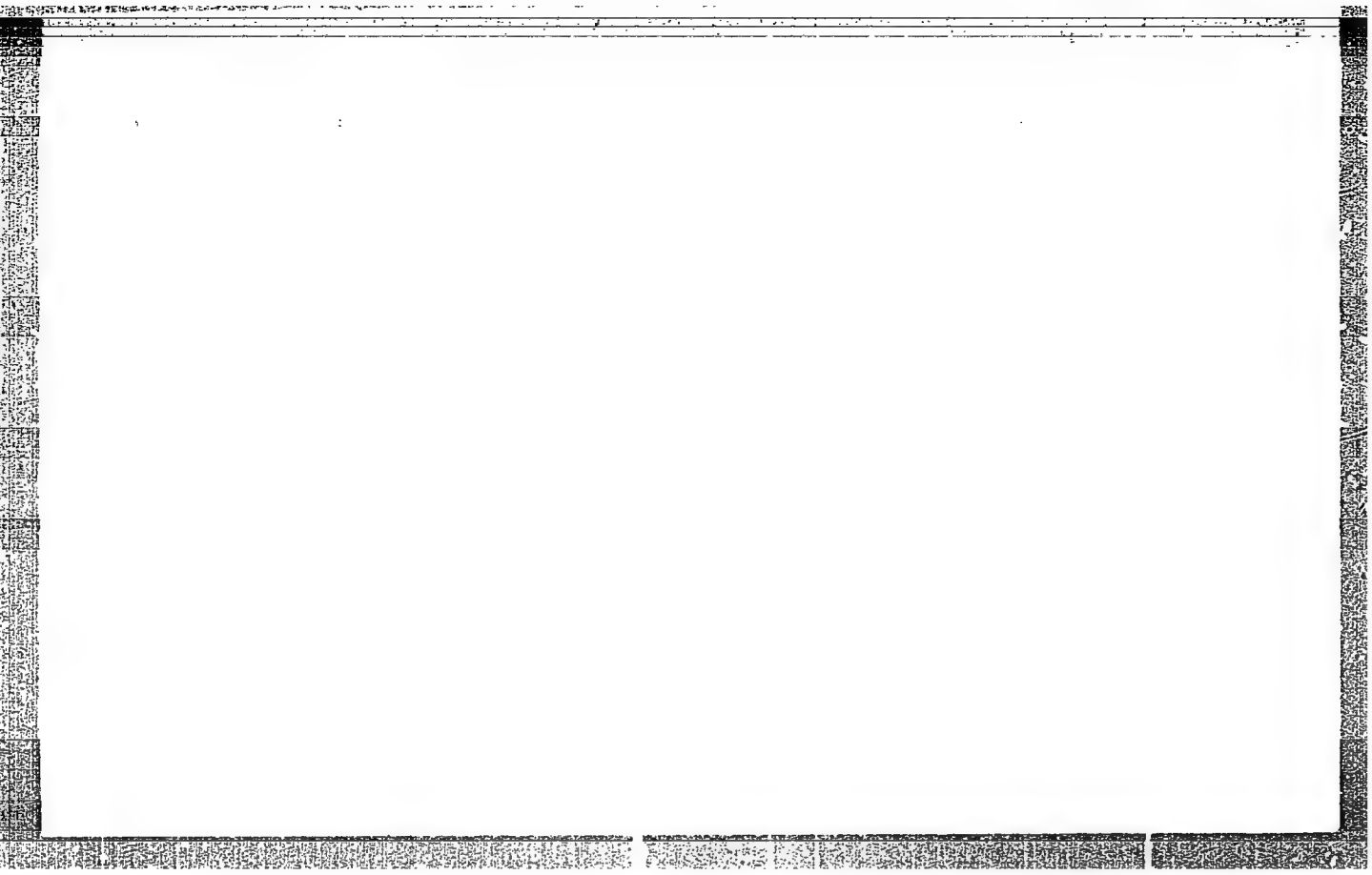
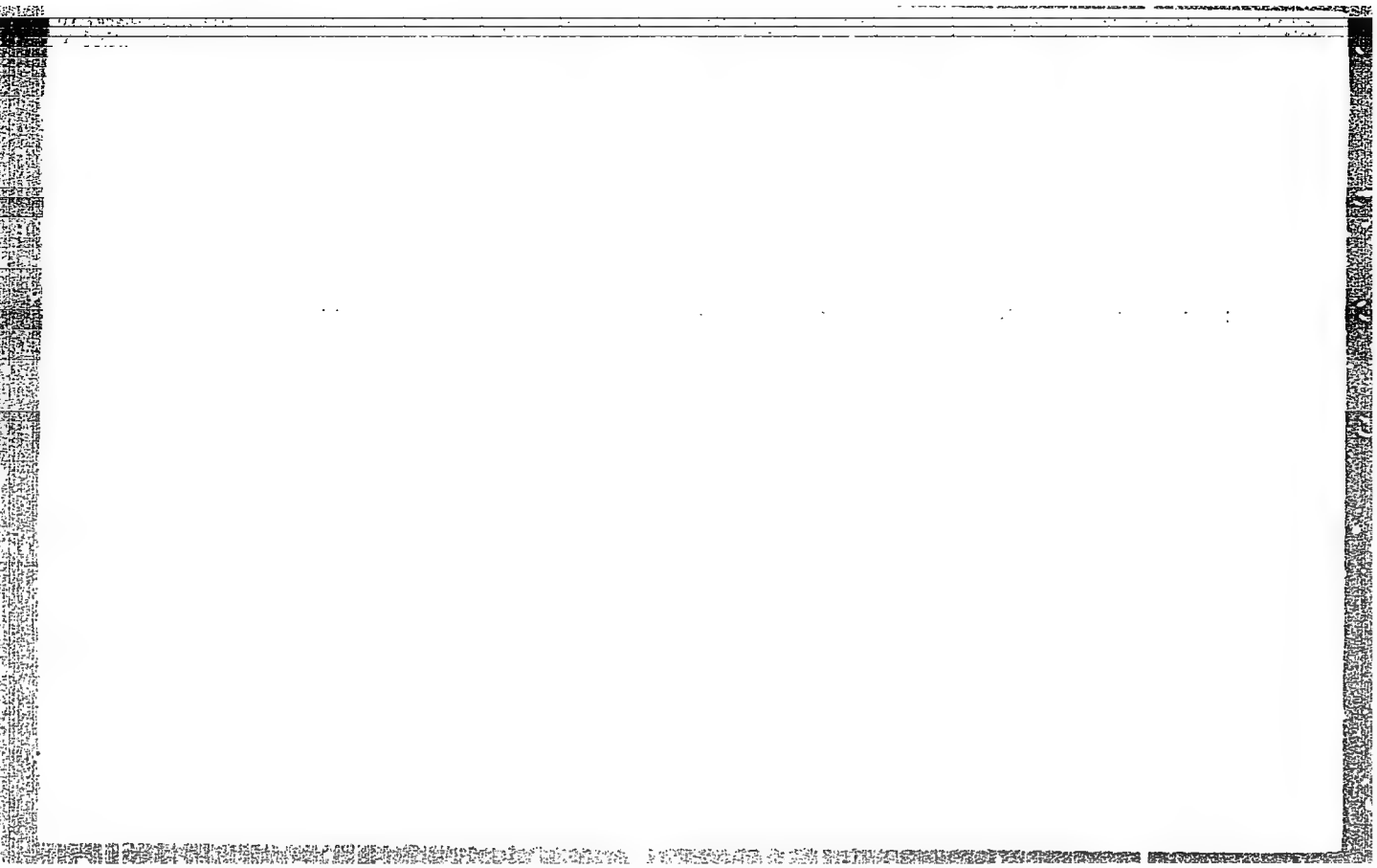
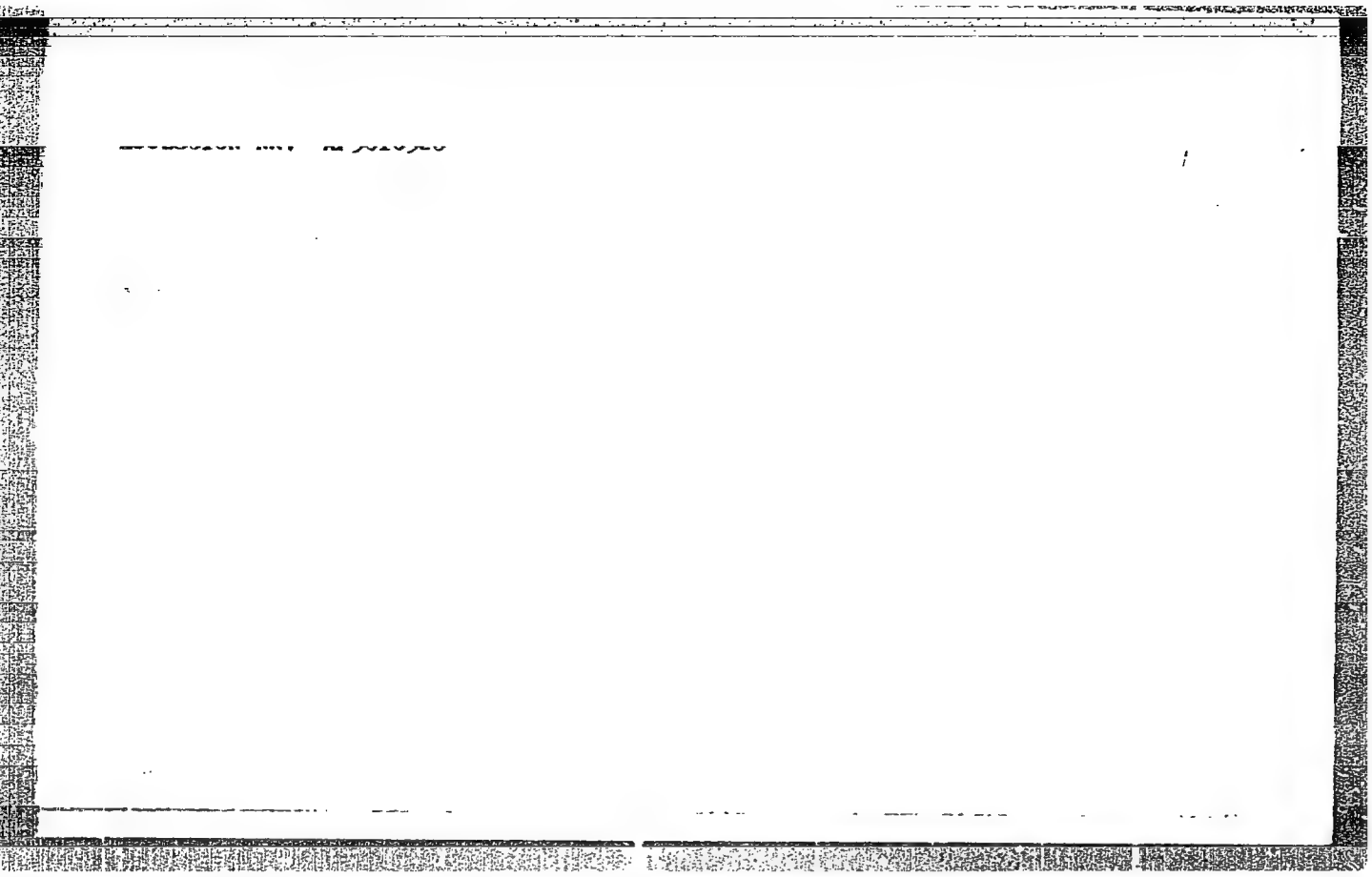


VINOKUR, B.B., kand. tekhn. nauk; BRAUN, M.P., doktor tekhn. nauk; KONDRASHEV, A.I., inzh.

Inefficiency of the use of boron steel for large articles. Mashinostroenie no.2:65-67 Mr-Ap '65. (MIRA 18:6)







VINOKUR, Bertol'd Bentsionovich; BRAUN, Mikhail Petrovich; MATYUSHENKO, Nelli Ivanovna; TIKHONOVSKAYA, Larisa Dmitriyevna; DRAYGOR, D.A., doktor tekhn. nauk, otv. red.

[Heat resistant steel; alloying, inoculation, and heat treatment] Zharoprochnaia stal'; legirovanie, modifitsirovanie i goriachaia obrabotka. Kiev, Naukova dumka, 1965. 265 p. (MIRA 18:6)

VINOKUR, B. Ye., inzh.

Stability of the outcrop of wall rock during the use of cable saws in Kizel Basin mines. [Trudy] VNIMI no.50:38-40 '63.
(MIRA 17:10)

LIN'KOV, Ye.M.; SMIRNOV, V.A.; VINOKUR, B.Sh.

Tiltmeter studies of rock bursts. Uch. zap. LGU no.324:155-161 '64.
(MIRA 18:4)

VINOKUR, B.Sh., inzh.

Using rock pressure during the mining of coal with a wire line saw in Kizel Basin mines. [Trudy] VNIMI no.49:151-157 '62. (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy marksheyderskiy institut.

ROZOV, B.V.; BUDKOV, V.Ye.; KORENEV, A.S.; KRIULYA, M.I.; TSUKERMAN, I.S.
ZOLOTNITSKIY, Yu.I.; PETUKHOV, I.M.; PAN'KOV, A.A.; VINOKUR, B.Sh.

Manless coal mining by means of a wire rope saw in the Kizel Basin.
Ugol' 35 no.7:38-44 Je '60. (MIRA 13:8)
1. Kombinat Kizelugol' (for Rozov, Budkov, Korenev, Kriulya, TSukerman, Zolotnitskiy). 2. Vsesoyuznyy nauchno-issledovatel'skiy marksheyderskiy institut (for Petukhov, Pan'kov, Vinokur).
(Kizel Basin--Coal mines and mining)
(Coal mining machinery)

BRAUN, M.P., prof., doktor tekhn.nauk; GURZHIYENKO, K.F., inzh.; KONDRASHEV, A.I., inzh.; VINOKUR, B.V., inzh.; GELLER, A.L., inzh.

Nickel-free steel for large forgings. Metalloved.i term.obr. met. no.12:16-17 D '60. (MIRA 13:12)

1. Institut liteynogo proizvodstva AN USSR i Novo-Kramatorskiy mashinostroitel'nyy zavod.
(Steel alloys) (Forging)

S/129/60/000/012/003/013
E073/E235

AUTHORS: Braun, M. P., Doctor of Technical Sciences, Professor, Gurzhiyenko, K. F., Kondrashev, A. I., Vinokur, B. V. and Geller, A. L., Engineers

TITLE: Nickel-less Steel for Large Forgings

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No. 12, pp. 16-17

TEXT: The authors developed the constructional steel 30ХГВТ (30KhGVT) (0.28-0.35% C; 0.17-0.37% Si; 1.0-1.2% Mn; 0.9-1.2% Cr; 0.7-0.9% W; 0.05-0.10% Ti; ≤ 0.030% S and P) the properties of which are at least as good as those of the hitherto used steel 40ХН (40KhN). The steel was smelted in a basic arc furnace and was cast into ingots weighing about 15.9 tons. From the ingot specimens were forged, the forgings being of 500 and 700 mm cross-section. To prevent formation of flocculi the forging was subject-ed to isothermal annealing. Following that, the influence of quenching and tempering on the mechanical properties and the proneness to temper brittleness was investigated. It was found that with increasing quenching temperature, the properties improved and

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E073/E235

Nickel-less Steel for Large Forgings

the proneness to temper brittleness decreased with an only slight deterioration in the plastic properties. The investigations enabled establishing that for the specimen forgings the following heat treatment is desirable: quenching from 900°C in oil and tempering at 600°C. After heat treatment 130 mm thick discs were cut from the specimens for the purpose of investigating the mechanical properties along the cross-section. For the above heat treatment the steel had the following properties: σ_b = 99 kg/mm^2, σ_s = 89 kg/mm^2, δ = 17%, ψ = 57%, a_k = 11.3 kgm/cm^2 (cooling in water after tempering) and 12.0 kgm/cm^2 (cooling in air after tempering). It was found that forgings of up to 700 mm cross-section had a sufficiently high hardenability, a high strength and plasticity. The impact strengths and the yield point and strength values did not differ greatly for the two types of steel. For instance, at a distance of 1/3 of the radius from the surface of a 700 mm cross-section forging, σ_s = 60 kg/mm^2 for a_k = 7 kgm/cm^2. Towards the centre of the specimen the yield point dropped to 43 kg/mm^2 whilst the impact strength remained the same. The properties of 500 mm

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E073/E235

Nickel-less Steel for Large Forgings

dia forgings were about the same but were more stable throughout the cross-section. The authors recommend using this new steel for large forgings of up to 700 mm cross-section instead of the hitherto used 40KhN steel and for forgings of up to 500 mm cross-sections instead of the hitherto used 35XHM (35KhNM) and 40XHM (40KhNM) steels. There are 4 tables and 7 Soviet references.

ASSOCIATION: Institut liteynogo proizvodstva AN USSR i Novo-Kramatorskiy mashinostroitel'nyy zabod
(Foundry Institute, Academy of Sciences, USSR and Novo-Kramatorsk Machine Building Works)

Card 3/3

OSTOLOPOVSKIY, A.N.; VINOKUR, B.Z.

Endothermic generators. Biul.tekh.-ekon. inform. Gos. nauch. issl. nauch. i tekh. inform. 17 no.9:30-32 S '64
(MIRA 18:1)

PAVLOVSKIY, V.B.; VINOKUR, D.Ya.

Modernize the assortment of linen fabrics taking into account consumers' requirements. Tekst. prom. 21 no. 4:8-10 Ap '61. (MIRA 14:7)
(Linen)

VINOKUR, D.Ya.; SHAFTAN, R.B.

Improve the selection of silk fabrics. Tekst. prom. 19 no.5:77-79 My '59. (MIRA 12:10)
(Textile fabrics) (Synthetic fabrics)

VINOKUR, D.Ya.; SHAFTAN, R.B.

Improving the selection and quality of staple fiber fabrics.
Tekst. prom. 19 no.6:75-76 Je '59. (MIRA 12:9)
(Textile fabrics)

VINOKUR, D.Ya.; FADEYEV, G.I.

External finish of silk fabrics. Tekst. prom. 17 no.5:60-62 My '57.
(Textile finishing) (Rayon) (MLRA 10:6)